PART A

IONOSPHERIC DATA

ISSUED
DECEMBER 1957

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 160
PART A

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
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CONTENTS

SYMBOLS, TERMINOLOGY, CONVENTIONS

Beginning with data reported for January 1952, and continuing through December 1956, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Sixth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Geneva, 1951. Excerpts concerning symbols and terminology from Document No. 626-E of this Meeting are given on pages 2-7 of the report CRPL-F89, "Ionospheric Data," issued January 1952. Reprints of these pages are available upon request.

Beginning with data for January 1957, the symbols used are given in NBS Report 5033, "Summary of Changes in Ionospheric Vertical Soundings, Observing and Scaling Procedures - Effective 1 January 1957," which draws upon the First Report of the Special Committee on World-Wide Ionospheric Soundings (URSI/AGI), Brussels, Sept. 2, 1956. A list of these symbols is available upon request.

In the Second Report of the Special Committee on World-Wide Ionospheric Soundings of the URSI/AGI Committee, May 1957, a new descriptive letter was introduced:

M Measurement questionable because the ordinary and extraordinary components are not distinguishable.

There was an expansion in meaning of the following:

Z (1) (qualifying letter) Measurement deduced from the third magnetoionic component.
(2) (descriptive letter) Third magnetoionic component present.

Beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

The following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given above.

a. For all ionospheric characteristics:

Values missing because of A, C, F, H, L, N, R or S are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of foF2 (and foE near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F (and h'E near sunrise and sunset) missing for this reason are counted usually as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count.

Values missing because of G are counted:

1. For foF2, as equal to or less than foF1.
2. For h'F2, as equal to or greater than the median.

The symbol W is included in the median count only when it replaces a height characteristic; the descriptive symbol D, only when it replaces a frequency characteristic.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of fEs missing because of E or G (and B when applied to the daytime E region only) are counted as equal to or less than the median foE, or equal to or less than the lower frequency limit of the recorder.

At night B for fEs is counted on the low side when there is a numerical value of foF2; otherwise it is omitted from the median count.

Values of fEs missing for any other reason, and values of h'Es missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If the count is four or less, the data are considered insufficient and no median value is computed.

2. For the F2 layer, h'F or foEs, if the count is from five to nine, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as the count is at least five, the median is not considered doubtful. A count of at least 5 is considered sufficient for an h'Es median.

3. For all layers, if more than half of the data used to compute the medians are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

Ordinarily, a blank space in the fEs or foEs column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of foE. Blank spaces at the beginning and end of columns of h'F2 or h'F1, foF1, h'E, and foE are usually the result of diurnal variation in these characteristics. Complete absence of medians of h'F1 and foF1 is usually the result of seasonal effects.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.

b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.

c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.

d. The tables may contain median values of either foEs or fEs. The graph of median Es corresponds to the table. Percentage curves of fEs are estimated from values of foEs when necessary.

PREDICTED AND OBSERVED SUNSPOT NUMBERS

The following predicted smoothed 12-month running-average Zürich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot Number										
	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948
December		150*	150	42	11	15	33	53	86	108	114
November		150*	147	35	10	16	38	52	87	112	115
October		150*	135	31	10	17	43	52	90	114	116
September		150*	119	30	8	18	46	54	91	115	117
August		150*	105	27	8	18	49	57	96	111	123
July		150*	95	22	8	20	51	60	101	108	125
June		150*	89	18	9	21	52	63	103	108	129
May	150*	150*	77	16	10	22	52	68	102	108	130
April	150*	150*	68	13	10	24	52	74	101	109	133
March	150*	150*	60	14	11	27	52	78	103	111	133
February	150*	150*	53	14	12	29	51	82	103	113	133
January	150*	150*	48	12	14	30	53	85	105	112	130

*This number is believed representative of solar activity at a maximum portion of the current sunspot cycle.

The latest available information follows concerning the corresponding observed Zürich numbers beginning with the minimum of April 1954. Final numbers are listed through June 1956.

Observed Sunspot Number

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1954				3	4	4	5	7	8	8	9	12
1955	14	16	19	23	29	35	40	46	55	64	73	81
1956	89	98	109	119	127	137	145	148	149	154	157	162
1957	169	171	174	181	186							

WORLD-WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 72 and figures 1 to 144 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Commonwealth of Australia, Ionospheric Prediction Service of the Commonwealth Observatory:
- Brisbane, Australia
- Canberra, Australia
- Townsville, Australia

Australian Department of Supply and Shipping, Bureau of Mineral Resources, Geology and Geophysics:
- Watheroo, Western Australia

University of Graz:
- Graz, Austria

Escola Politecnica, University of Sao Paulo:
- Sao Paulo, Brazil

British Department of Scientific and Industrial Research, Radio Research Board:
- Falkland Is.
- Ibadan, Nigeria (University College of Ibadan)
- Inverness, Scotland
- Singapore, British Malaya
- Slough, England

Defence Research Board, Canada:
- Baker Lake, Canada
- Churchill, Canada
- Ottawa, Canada

Radio Wave Research Laboratories, National Taiwan University, Taipeh, Formosa, China:
- Formosa, China

General Direction of Posts and Telegraphs, Helsinki, Finland:
- Nurmijarvi, Finland

Heinrich Hertz Institute, German Academy of Sciences, Berlin:
- Juliusruh/Rügen, Germany

The Royal Netherlands Meteorological Institute:
- De Bilt, Holland

Christchurch Geophysical Observatory, New Zealand Department of Scientific and Industrial Research:
- Campbell I.
- Rarotonga, Cook Is.
- Scott Base

Norwegian Defence Research Establishment, Kjeller per Lillestrom, Norway:
- Oslo, Norway
- Tromso, Norway

Institute of Terrestrial Magnetism, Ionosphere and Radio Propagation, Moscow, U.S.S.R.:
- Ashkhabad
- Irkutsk
- Providenie Bay
- Rostov-on-Don
- Sverdlovsk

South African Council for Scientific and Industrial Research:
- Capetown, Union of South Africa
- Johannesburg, Union of South Africa

Research Institute of National Defence, Stockholm, Sweden:
- Kiruna, Sweden
- Lycksele, Sweden
- Upsala, Sweden

Royal Board of Swedish Telegraphs, Radio Department, Stockholm, Sweden:
- Lulea, Sweden

Post, Telephone and Telegraph Administration, Berne, Switzerland:
- Schwarzenburg, Switzerland

United States Army Signal Corps:
- Ft. Monmouth, New Jersey
- Okinawa I.
- St. John's, Newfoundland
- Thule, Greenland
- White Sands, New Mexico

National Bureau of Standards (Central Radio Propagation Laboratory):
- Anchorage, Alaska
- Panama Canal Zone
- Puerto Rico, W. I.
- Washington, D. C.

INDEX OF IONOSPHERIC DATA PUBLISHED IN 1957

(CRPL-F149(A) THROUGH F160(A))

The following index of tables and graphs of ionospheric data published in the CRPL-F(A) series in 1957 is divided into two parts. Part I is an index of data observed in 1956 and 1957. Part II is an index of data observed prior to 1956.

In general, both table and graphs for a given station for a given month appear in the same issue.

Indexes of ionospheric data published prior to 1957 are in IRPL-F17, CRPL-F28, -F40, -F52, -F64, -F76, -F88, -F100, -F112, -F124, -F136(A), and -F148(A).

PART I

Index of Tables and Graphs of Ionospheric Data Observed in 1956 and 1957 and Published in 1957 (CRPL-F149(A) through F160(A))

Station	1956												1957											
	J	F	M	A	M	J	Jy	A	S	O	N	O	J	F	M	A	M	J	Jy	A	S	O	N	
Adak, Alaska										149	150	151	153	154	155	155	156	158		159	159			
Ahmedabad, India	150	151			154	155	157	159	159															
Akita, Japan						149	149	150	151	153		153	155	155	157	157	158							
Alma-Ata, U.S.S.R.													155		157									
Anchorage, Alaska									149	151	151	151	152	152	155	155	156	158		159	160			
Ashkhabad, U.S.S.R.													155		160									
Baguio, P. I.								150	149	150	152	151	154	155	155	156	158	159						
Baker Lake, Canada						149	150	151	151	152	153	154	154	155	156	157	158	159		160				
Bombay, India	150	151			154	155	157	159	159															
Brisbane, Australia	150	151	153	154	154	153	152	152	153				156		158	158	158	159		160				
Budapest, Hungary				152	154	152		159	159									159						
Buenos Aires, Argentina						149	149	150	151	152	153	154	154	156	156	157								
Calcutta, India	150	151			154	158	158		159															
Canberra, Australia	150	151	153	154	154	153	152	152	153[a]									159		160				
Capetown, Union of S.Africa						149	149	150	151	152	153	153	154	155	156	157	158	160						
Casablanca, Morocco	155	155	156	157	159																			
Chita, U.S.S.R.															157									
Christchurch, New Zealand		151			154	150	151	150	151	153		154	154	157	156	159	159							
Churchill, Canada						149	150	151	152	153	153	154	154	155	156	158	158	159		160				
De Bilt, Holland							149	150	150	152	153	153	154	155	156	156	156	159		159	160			
Decepcion I.							150	150	151	152	153													
Delhi, India	150	151			154	155	157	159	159															
Elisabethville, Belgian Congo						149	150	151	151	153	154	154	154	157	157	158	158							
Fairbanks, Alaska											150	151	152	153	155	156	157	157		159	159			
Falkland Is.					152	152	156	156	157	156	156	156	157	160	160									
Formosa, China											149	150	154	155	153	157	158	158		157	158	160	160	
Ft. Monmouth, New Jersey											149	150	152	154	155	155	156	157		160				
Godhavn, Greenland								150			157	159	158	158	158	158								
Grand Bahama I.																		159		159				
Graz, Austria									151		149	150	151	152	156	156	155	159			160			
Hobart, Tasmania	150	151	153	154	154	153	152	152	153				158				159	159						
Huancayo, Peru									150		153	153	155	155	157	158	158	158		159				
Ibadan, Nigeria	152	152	156	156	157	157	156	156	157	157	159	158		160										
Inverness, Scotland					152	152	152	159	158	156	156	156	156	160	160	160	160	160						
Irkutsk, U.S.S.R.													155		160									
Johannesburg, Union of S.Africa						149	149	150	151	152	153	153	154	155	157	157	158	160		160				
Juliusruh/Rügen, Germany																160		160						
Kiruna, Sweden							149	150	151	152	153	154	154	155	156	156	158	158		158	159	160		
Kodaikanal, India	150	151			154	155	157	159	159															
Leningrad, U.S.S.R.													155		157									
Leopoldville, Belgian Congo						149	150	151	151	153	154	154	154	157	157	158	158							
Lindau/Harz, Germany						149	149	151	151	153	153	153	154	155	156	157	159	159						
Lulea, Sweden			154	153	154	155	157	158	160	160	153	153	154	155	155									
Lycksele, Sweden													152	152	153	157	158	159		158	159	160	160	
Madras, India	150	151			154	155	157	159	159															
Maui, Hawaii											149	150	152	152	154	155	156	156		159	159			
Monte Capellino, Italy					150	150	150	150	151															
Moscow, U.S.S.R.													155		157									
Nairobi, Kenya														155	156	157	158							
Narsarssuak, Greenland										149	151	151	152	153	155									
Nurmijarvi, Finland													154[b]	155[b]	156[b]	156[b]				159		160		
Okinawa I.											150	151	152	153	154	155	156	157		160	160			
Oslo, Norway											149	154	152	152	153	157	155	159		160	160			
Ottawa, Canada						149	150	151	151	153	153[c]	154	154	155	155	157	158	159		160	160			
Panama Canal Zone											149	150	153	154	154	155	156	158		160				

PART I (CONTINUED)

Station	1956 J	F	M	A	M	J	Jy	A	S	O	N	D	1957 J	F	M	A	M	J	Jy	A	S	O	N
Point Barrow, Alaska							150	150		150	150	150	152	152	154	155	156	158	159				
Poitiers, France	155	155	157	157	159																		
Port Lockroy				152	152	152	156	159	156	157	157	157	158	158[d]									
Providenie Bay, U.S.S.R.															160								
Puerto Rico, W. I.											150	150	152	152	154	156	156	156	159	160			
Rarotonga I.	150	151	152	153	150	151	150	151	151	153	153	154	154		157	158	160						
Resolute Bay, Canada						149	150	151	151	153	153	154	154	155	155	158	158	159					
Reykjavik, Iceland										149	152	152	154	155	155	156	157	157	159				
Rostov-on-Don, U.S.S.R.													155		160								
St. John's, Newfoundland														154	154	156	157	157	159	160			
San Francisco, California											151	151	152[e]	153	155	155	156	158	159				
Sao Paulo, Brazil						150	159	159	160	160													
Schwarzenburg, Switzerland								151	151	152	154	153	154	155	156	157	158	159	159	159	160		
Scott Base															156	158	158		160				
Simferopol, U.S.S.R.													157		157								
Singapore, British Malaya					152	152	152	156	159	156	156	156	158		160	160							
Slough, England					152[f]	152	156	156	157	156	156	156	156	157	158	160	160	160					
Svalbard, Norway						151																	
Sverdlovsk, U.S.S.R.													155		160								
Talara, Peru								150	151		153	154	158	155	158	158[g]	158	159					
Thule, Greenland										150	150	153	152	153	155	155	157	158	160				
Tiruchy, India	150	151			154	155	157	159	159														
Tokyo, Japan						149	149	150	151	153		153	156	155	157	157	158						
Tomsk, U.S.S.R.													155		157								
Townsville, Australia	150	151	153	154	154	153	152	152	153				158	158	158	158	158	160	160				
Tromso, Norway							149	150	151	153	160	153	154	155	156	157	158	159	159	160			
Upsala, Sweden											149		154	152	153	156	155	159	158	158	160		
Wakkanai, Japan						149	149	150	151	153		153	155	155	157	157	158						
Washington, D. C.												149[h]	150	151	152	153	154	155	158	160			
Watheroo, W. Australia							150	151	151	153	153	154	154	155	156	156	157[i]	159		160			
White Sands, New Mexico											150	151	152	153	154	156	156	158	159	160			
Winnipeg, Canada						149	150	151	151	153	153	154	154	155	156	157	158	159	159				
Yakutsk, U.S.S.R.														157	157								
Yamagawa, Japan						149	149	150	151	153		153	156	155	157	157	158						
Yuzhno-Sakhalinsk, U.S.S.R.															157								

[a]See erratum 2 in CRPL-F154(A), p. 8.
[b]See erratum 1 in CRPL-F157(A), p. 8.
[c]See erratum 1 in CRPL-F154(A), p. 8.
[d]See erratum 2 in CRPL-F159(A), p. 8.
[e]See erratum 1 in CRPL-F153(A), p. 8.
[f]See erratum 2 in CRPL-F153(A), p. 8.
[g]See erratum 1 in CRPL-F159(A), p. 8.
[h]See erratum 1 in CRPL-F150(A), p. 10.
[i]See erratum 1 in CRPL-F158(A), p. 8.

PART II

Index of Tables and Graphs of Ionospheric Data Observed Prior to 1956 and Published in 1957 (CRPL-F149(A) through F160(A))

Station	1955 J	F	M	A	M	J	Jy	A	S	O	N	D	1954 J	F	M	A	M	J	Jy	A	S	O	N	D
Ahmedabad, India											149	149												
Bombay, India											149	149												
Brisbane, Australia												149												
Calcutta, India											149	149												
Campbell I.	160	160	160	160	160								160	152	152	160	160	150	150	151	151	152		158
Canberra, Australia												149												
Casablanca, Morocco									152		150	149												
Delhi, India											149	149												
Hobart, Tasmania												149[a]												
Kodaikanal, India											149	149												
Madras, India											149	149												
Poitiers, France									152		150	149												
Rarotonga I.												152												
Tananarive, Madagascar																								149
Tiruchy, India											149	149												
Townsville, Australia												149												

Station	1953 J	F	M	A	M	J	Jy	A	S	O	N	D	1952 J	F	M	A	M	J	Jy	A	S	O	N	D
Campbell I.		152	152			150	150	151	152	160		160		151	152	152		151	151		152			
Leopoldville, Belgian Congo															156									

Station	1946 J	F	M	A	M	J	Jy	A	S	O	N	D
Tokyo, Japan								151				

[a]See erratum 2 in CRPL-F150(A), p. 10.

Radio Noise Data

The results of radio noise measurements are presented in the following graphs and tables. These are based on three parameters of the noise: (1) the mean power, (2) the mean envelope voltage, and (3) the mean logarithm of the envelope voltage. The mean power averaged over a period of several minutes is the basic parameter and is expressed as an effective antenna noise figure, F_a. F_a is defined as the noise power available from an equivalent lossless antenna in db above ktb (the thermal noise power available from a passive resistance) where

k = Boltzman's constant (1.38×10^{-23} joules per degree Kelvin)

t = Absolute room temperature (taken as 288° K)

b = Bandwidth in cycles per second.

The mean voltage and mean logarithm are expressed as deviations, V_d and L_d, respectively, in db below the mean power.

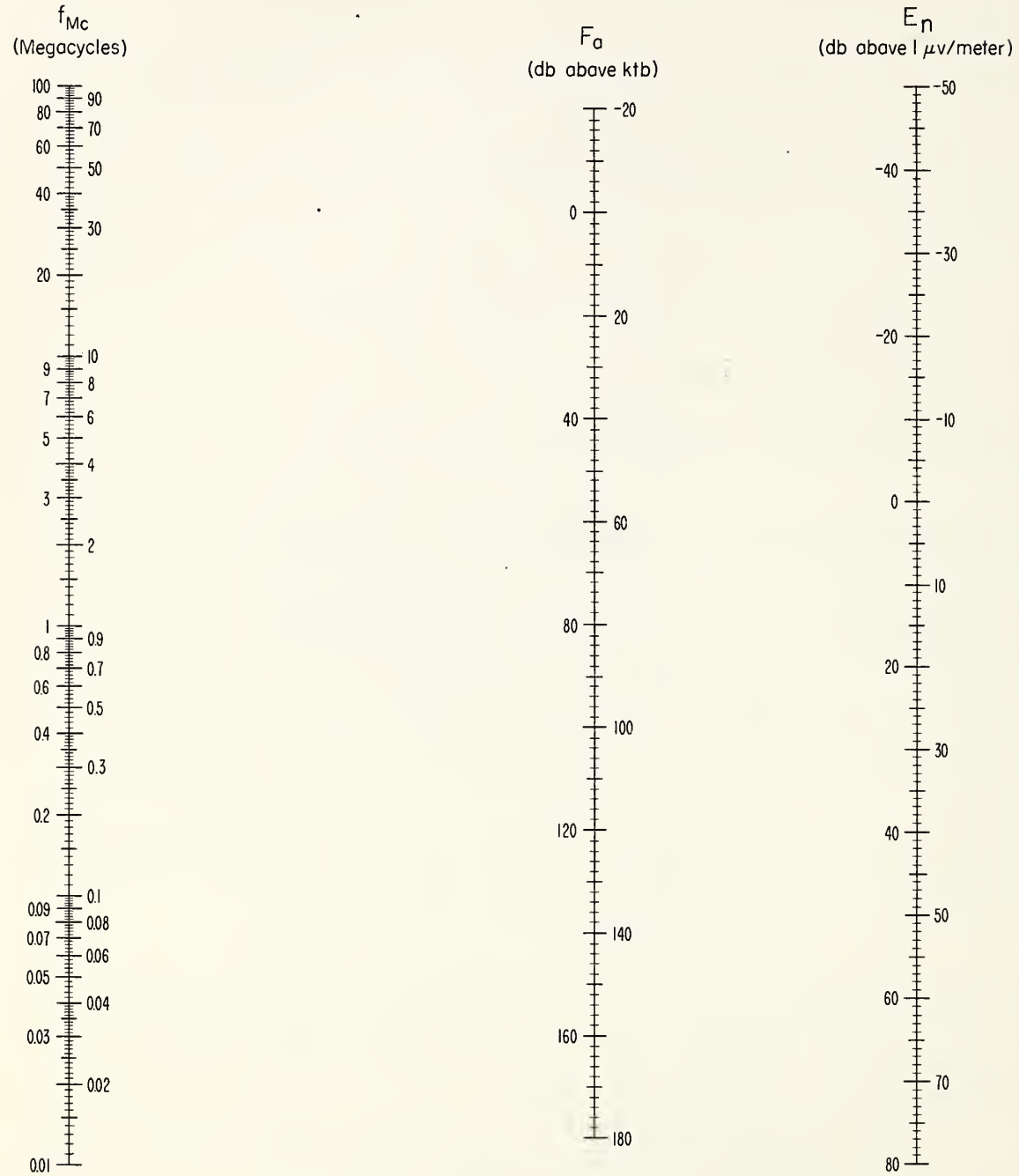
Measurements of these parameters were made with the National Bureau of Standards Radio Noise Recorder, Model ARN-2, which has an effective noise bandwidth of 280 cycles per second and uses a standard 21.75' vertical antenna. A 15-minute recording is made on each frequency each hour, and these 15-minute samples are taken as representing the noise conditions for the full hour. The month-hour medians, F_{am}, V_{dm}, and L_{dm} are determined from these hourly values for each of the corresponding parameters and the resulting medians are plotted at the half-hour point on the curves. Normally from 25 to 30 observations of the mean power are obtained monthly for each hour of the day, and from 10 to 15 observations of the voltage and logarithm deviations. When there are fewer than 15 observations of the mean power, or 7 observations of the voltage and logarithm deviations, the tabulated values are identified by an asterisk (*).

The upper and lower decile values of F_a are also reported in the following tabulation to give an indication of the extent of the variation of the noise power from day to day at a given time of day. These are expressed in db above and below the month-hour median, F_{am}, and designated by D_u and D_ℓ, respectively.

To convert F_a to an r.m.s. noise field strength, E_n, the nomogram or the equation on the following page may be used.

Information on expected worldwide noise levels and their application to systems problems is presented in NBS Circular 557 (available from the Supt. of Documents, U. S. Govt. Printing Office, Washington 25, D. C.). More recent estimates of radio noise levels are given in CCIR Report No. 65, "Report on Revision of Atmospheric Radio Noise Data", Warsaw, 1956 (available from the International Telecommunication Union, Geneva).

NOMOGRAM FOR TRANSFORMING EFFECTIVE ANTENNA NOISE FIGURE TO NOISE FIELD STRENGTH AS A FUNCTION OF FREQUENCY



$$E_n = F_a + 20 \log_{10} f_{Mc} - 65.5$$

F_a = Effective Antenna Noise Figure = External Noise Power Relative to ktb Available from an Equivalent Short, Lossless, Vertical Antenna in db Above ktb.

E_n= Equivalent Vertically Polarized Ground Wave R.M.S. Noise Field Strength in db Above 1 μv/meter for a 1 kc Bandwidth.

f_{Mc}= Frequency in Megacycles.

RADIO NOISE DATA

Station Bill, Wyoming Lat. 43.2° N Lang. 105.2° W Type Recorder ARN-2 Month October 19 57

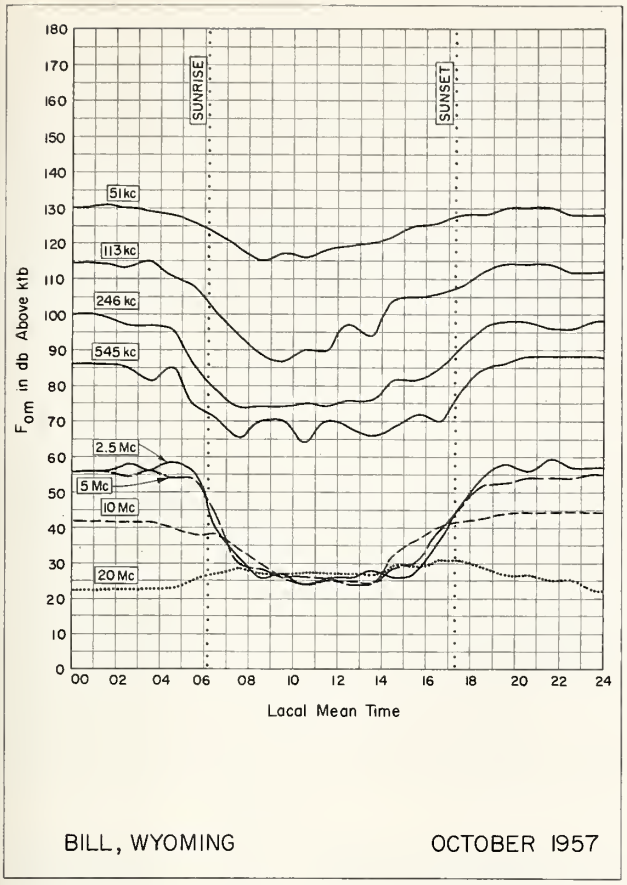
	Local Mean Time																							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	51 kc																							
F_{am}	130	131	130	129	128	126	123	119	115	117	116	118	119	120	122	125	126	128	128	130	130	130	128	128
D_u	7	7	8	7	6	8	9	11	13	10	14	12	13	9	8	7	7	8	7	6	8	9	9	9
D_ℓ	8	8	8	7	6	8	8	9	7	14	14	12	15	14	15	16	15	5	10	9	9	8	6	6
V_{dm}																								
L_{dm}																								
	113 kc																							
F_{am}	114	114	113	115	111	108	101	94	89	87	90	90	97	94	104	105	106	108	112	114	114	114	112	112
D_u	8	8	7	5	7	8	10	14	16	19	18	18	13	16	8	17	8	9	9	6	8	9	10	10
D_ℓ	9	8	11	12	13	13	12	14	13	11	10	12	19	16	25	11	17	13	9	11	10	10	8	8
V_{dm}																								
L_{dm}																								
	246 kc																							
F_{am}	100	99	97	97	96	86	79	74	74	74	75	74	76	76	82	82	84	90	96	98	98	96	96	98
D_u	6	6	9	7	8	15	9	12	10	10	7	8	12	12	9	20	20	11	10	8	11	11	12	11
D_ℓ	13	10	11	13	17	10	9	3	2	2	3	2	4	4	10	10	10	10	9	13	10	6	9	9
V_{dm}																								
L_{dm}																								
	545 kc																							
F_{am}	86	86	85	82	85	74	71	66	70	70	64	70	68	66	68	72	70	78	84	86	88	88	88	88
D_u	6	4	5	8	5	9	4	1	2	2	11	4	10	6	6	14	15	10	9	6	9	7	7	8
D_ℓ	7	6	8	9	8	10	3	2	4	4	2	4	4	4	4	3	4	9	6	7	10	9	9	8
V_{dm}																								
L_{dm}																								
	2.5 Mc																							
F_{am}	56	56	58	56	58	56	40	32	26	27	24	26	26	28	26	27	36	46	54	58	56	59	57	57
D_u	8	14	12	10	6	6	12	10	8	5	9	7	8	4	8	20	17	10	10	8	8	9	9	11
D_ℓ	6	10	10	10	16	14	6	10	6	7	4	6	6	8	6	7	15	12	8	8	4	7	5	7
V_{dm}																								
L_{dm}																								
	5 Mc																							
F_{am}	56	56	54	56	54	54	44	30	28	*26	26	26	24	24	28	30	38	46	52	53	54	54	54	55
D_u	6	6	8	6	6	6	6	8	6		6	6	8	8	6	8	10	10	8	7	6	6	8	7
D_ℓ	10	8	6	8	6	8	2	2	10		9	12	10	10	12	16	6	4	8	5	8	8	8	9
V_{dm}																								
L_{dm}																								
	10 Mc																							
F_{am}	42	42	42	42	40	38	38	34	30	*26	24	25	25	26	32	36	40	42	43	44	44	44	44	44
D_u	2	4	4	4	4	6	6	4	5		10	9	9	10	6	6	4	4	7	4	2	2	2	2
D_ℓ	0	0	2	4	2	2	2	4	5		2	4	4	4	6	8	4	2	3	4	4	4	2	4
V_{dm}																								
L_{dm}																								
	20 Mc																							
F_{am}	23	23	23	23	23	25	27	29	27	27	27	27	27	27	29	29	31	31	29	27	27	25	25	23
D_u	2	2	2	2	2	2	4	2	4	2	4	18	12	6	4	2	2	4	6	4	2	2	0	2
D_ℓ	2	2	2	2	2	2	4	4	2	4	4	4	2	4	2	2	2	2	0	2	2	2	2	0
V_{dm}																								
L_{dm}																								

GPO 845918

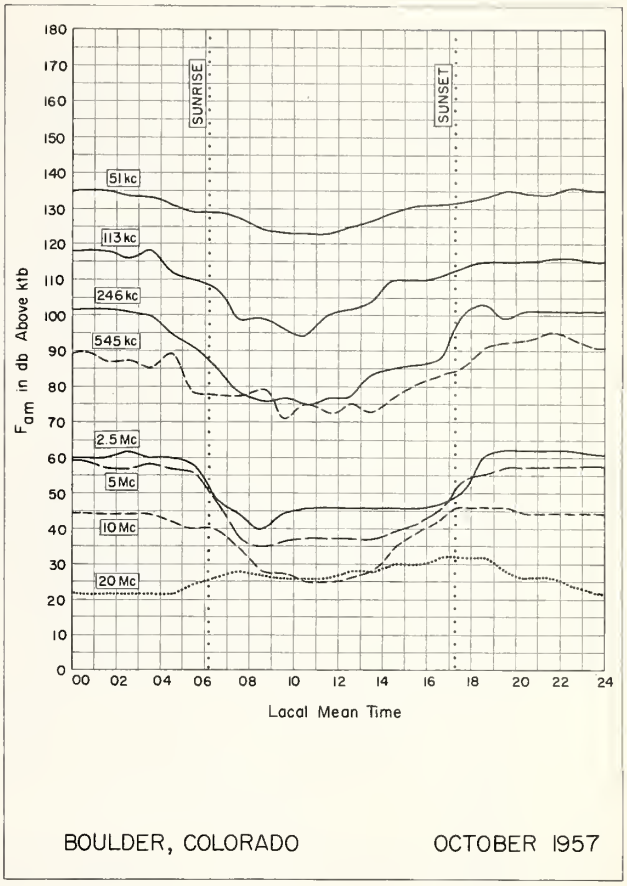
RADIO NOISE DATA

Station Boulder, Colorado Lat. 40.1° N Long. 105.1° W Type Recorder ARN-2 Month October 19 57

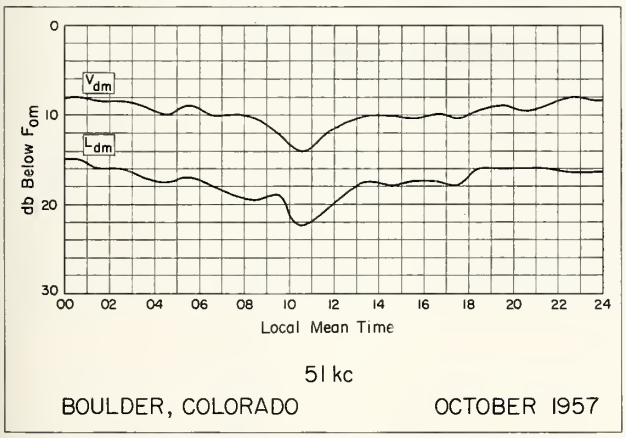
	Local Mean Time																							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
51 kc																								
F_{am}	135	135	133	133	131	129	129	127	124	*123	*123	123	125	127	129	131	131	132	133	135	134	134	136	135
D_u	6	6	10	10	10	10	8	8	9			12	12	10	9	9	8	7	6	6	7	5	5	6
D_ℓ	6	8	6	6	6	8	10	14	12			10	12	16	14	15	14	15	10	8	5	5	9	8
V_{dm}	8.0	8.5	8.5	9.0	10.0	9.0	10.0	10.0	10.5	*12.0	*14.0	*12.5	11.0	10.0	10.0	10.5	10.0	10.5	9.5	9.0	9.5	9.0	8.0	8.5
L_{dm}	15.0	16.0	16.0	17.0	17.5	17.0	18.0	19.0	19.5	*19.0	*22.5	*21.0	19.0	*17.5	18.0	17.5	17.5	18.0	16.0	16.0	16.0	16.0	16.5	16.5
113 kc																								
F_{am}	118	118	116	118	112	110	107	98	99	*96	94	100	102	104	110	110	111	113	115	115	115	116	116	115
D_u	6	6	10	8	14	12	11	18	13		22	12	16	12	7	10	11	13	9	9	11	10	10	11
D_ℓ	10	8	8	10	10	14	19	22	19		16	20	24	24	26	26	21	17	9	9	7	8	6	7
V_{dm}	7.0	7.0	8.0	8.5	9.5	9.5	10.0	10.0	*11.0	*13.5	*8.0	*12.0	11.0	9.5	8.5	*11.0	9.5	*8.5	7.5	8.5	8.0	8.0	7.5	7.0
L_{dm}	15.0	15.0	14.0	16.5	17.0	18.5	19.0	18.0	*21.5	*24.0	*14.0	*21.0	21.0	19.0	17.0	*19.5	15.0	*16.0	15.0	16.0	15.5	15.5	14.0	14.0
246 kc																								
F_{am}	102	102	101	100	95	91	85	78	76	*77	75	77	77	83	85	86	87	99	103	99	101	101	101	101
D_u	7	9	12	13	16	12	12	15	21		18	15	24	12	13	25	25	18	8	16	14	10	10	10
D_ℓ	11	9	8	9	12	14	12	7	5		4	6	6	10	12	13	10	10	16	10	10	8	12	6
V_{dm}	6.5	6.0	7.5	7.0	8.0	*9.0	*8.0	*7.0	*6.0	*7.0	*7.0	*8.0	8.5	*6.0	*6.5	*9.0	*6.0	*7.5	7.0	7.0	6.5	7.0	6.5	6.5
L_{dm}	13.5	12.5	13.5	15.0	16.0	*15.0	*17.0	*11.0	*9.5	*13.0	*12.0	*11.5	13.0	*12.0	*12.5	*15.0	*13.5	*14.5	14.0	13.5	14.5	14.0	13.5	13.0
545 kc																								
F_{am}	89	87	87	85	89	78	77	77	79	*71	75	73	75	73	77	81	83	85	91	92	93	95	93	91
D_u	10	12	10	12	8	10	8	12	7		6	6	8	7	8	15	20	14	8	9	6	6	8	6
D_ℓ	8	6	6	8	12	7	6	9	9		6	4	4	6	7	7	12	12	8	7	6	10	6	6
V_{dm}	5.5	5.0	6.0	*5.0	*5.0	*3.5	*5.0	*3.0		*4.0	*3.5	*2.5	*4.0	*2.0	*7.0	*2.5	*10.0	*5.0	*5.0	5.0	*3.5	5.0	4.5	5.0
L_{dm}	11.0	12.0	12.0	*12.5	*12.0	*6.0	*8.0	*4.5		*7.5	*8.5	*4.0	*7.5	*4.5	*13.5	*5.0	*18.0	*10.0	*10.5	10.0	*8.0	9.0	8.5	10.0
2.5 Mc																								
F_{am}	60	60	62	60	60	58	48	44	40	*44	*46	46	46	46	46	46	47	50	60	62	62	62	62	61
D_u	10	8	6	9	6	10	13	5	8			2	4	2	2	6	9	11	7	8	7	6	6	9
D_ℓ	6	8	12	12	14	16	7	7	4			6	5	5	4	4	7	4	7	8	6	6	8	7
V_{dm}	4.0	4.5	4.5	4.0	6.0	5.0	2.5	2.0	2.0	1.0	*1.5	1.5	2.0	1.5	1.5	1.5	2.5	2.5	3.5	3.0	5.0	4.0	4.0	5.0
L_{dm}	8.0	8.0	9.5	10.0	11.0	10.5	4.5	3.5	3.0	2.5	*3.0	2.5	2.5	2.5	3.0	3.0	4.0	5.0	7.5	7.5	9.5	9.0	9.0	9.0
5 Mc																								
F_{am}	59	57	57	58	57	56	47	37	35	*36	37	37	37	37	39	41	45	53	55	57	57	57	57	57
D_u	2	4	6	5	6	5	6	8	8		7	6	8	8	6	7	6	4	8	6	6	4	4	4
D_ℓ	10	8	6	7	8	9	4	6	8		6	6	4	4	5	7	6	8	6	8	8	10	8	10
V_{dm}	4.0	4.0	3.5	4.0	4.0	4.0	3.0	2.0	2.0	1.5	1.5	1.0	2.0	1.5	1.5	2.0	3.5	3.0	3.0	3.5	4.0	4.0	4.0	4.0
L_{dm}	8.0	8.0	8.0	8.0	7.5	8.0	7.0	3.5	3.5	3.0	3.5	3.5	3.5	3.0	3.0	3.0	5.5	6.0	7.0	7.5	8.5	8.0	8.0	8.0
10 Mc																								
F_{am}	44	44	44	44	42	40	40	34	28	*27	25	25	26	28	34	38	42	46	46	46	44	44	44	44
D_u	3	2	4	2	4	4	4	6	10		12	10	10	12	4	6	4	2	4	3	4	4	4	3
D_ℓ	2	2	3	4	2	4	4	4	2		5	3	3	2	6	8	4	6	4	4	2	2	2	2
V_{dm}	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.5	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.5	3.0	3.0
L_{dm}	5.5	6.0	6.0	5.5	7.0	5.5	6.0	6.0	6.0	6.0	3.0	4.0	4.0	5.5	6.0	6.5	6.0	6.5	6.0	6.0	6.5	6.0	6.0	6.0
20 Mc																								
F_{am}	22	22	22	22	22	24	26	28	27	*26	26	26	28	28	30	30	32	32	32	28	26	26	24	22
D_u	0	0	0	0	0	2	4	6	6		2	9	8	4	6	2	6	4	6	9	8	2	2	3
D_ℓ	0	2	2	2	0	2	2	2	1		2	2	2	2	4	2	2	3	6	2	2	2	2	0
V_{dm}	1.0	1.0	1.0	1.0	1.0	1.5	2.0	1.0	1.0	*1.5	1.5	1.0	1.5	*2.5	2.0	1.5	2.0	1.5	2.0	2.0	2.0	2.0	1.0	1.0
L_{dm}	2.0	2.0	2.0	2.5	2.5	2.5	4.0	3.0	3.0	*4.0	3.0	4.0	3.5	*4.0	4.0	3.5	3.5	2.5	4.0	4.5	4.0	4.0	3.0	2.5



BILL, WYOMING OCTOBER 1957

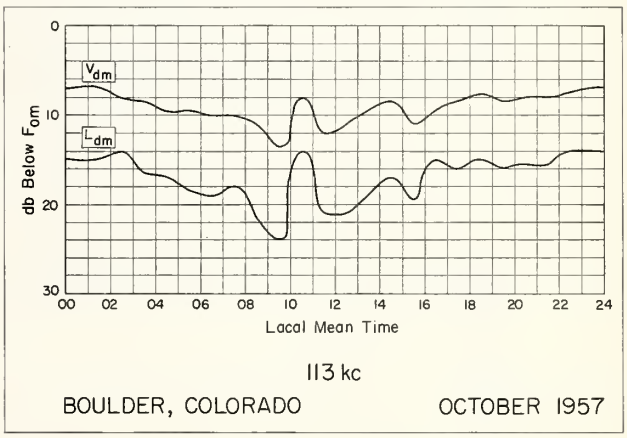


BOULDER, COLORADO OCTOBER 1957



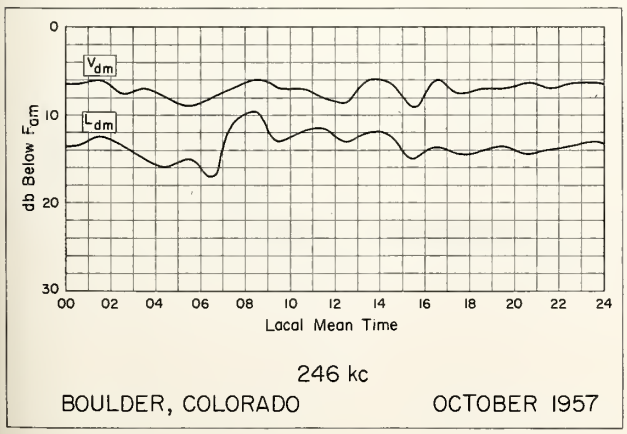
51 kc

BOULDER, COLORADO OCTOBER 1957



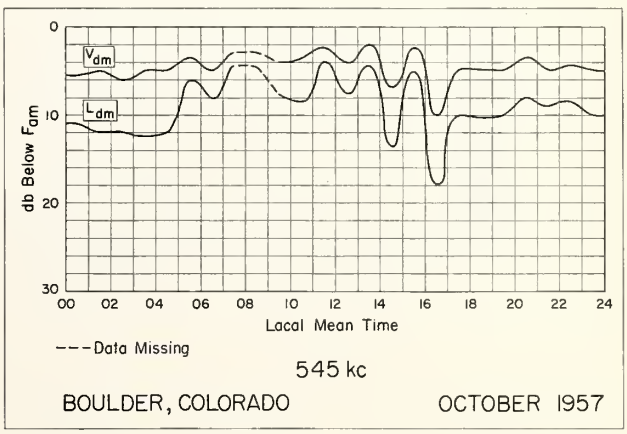
113 kc

BOULDER, COLORADO OCTOBER 1957



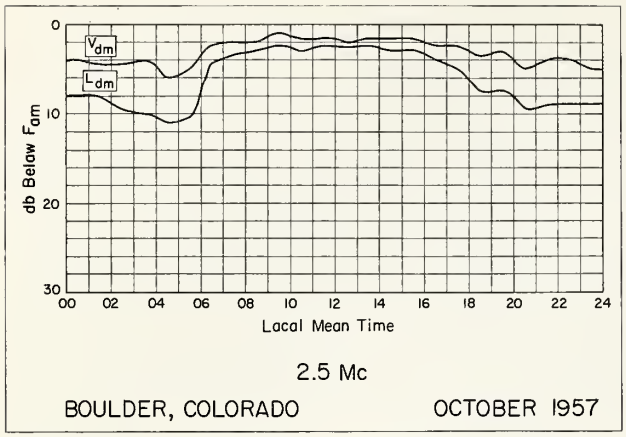
246 kc

BOULDER, COLORADO OCTOBER 1957



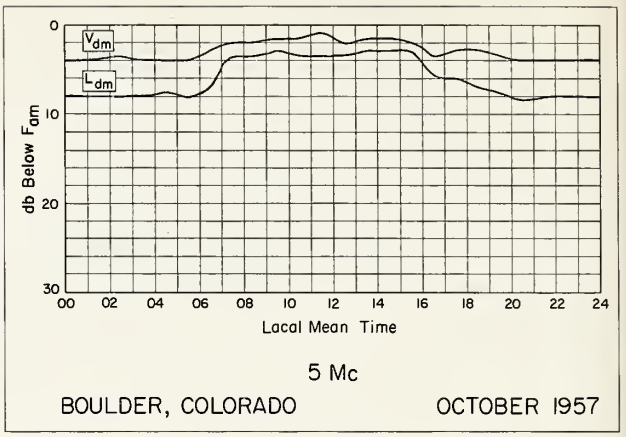
545 kc

BOULDER, COLORADO OCTOBER 1957



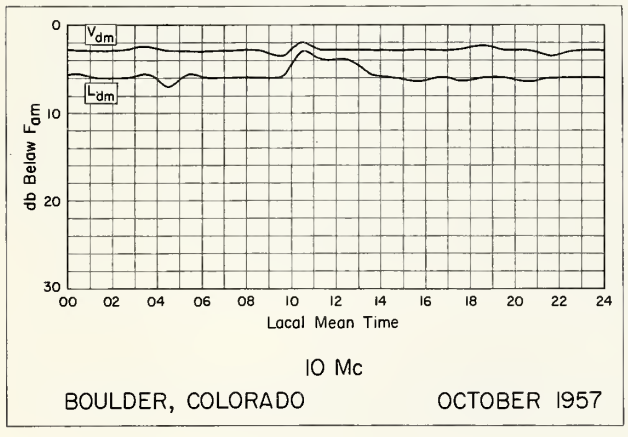
2.5 Mc

BOULDER, COLORADO OCTOBER 1957



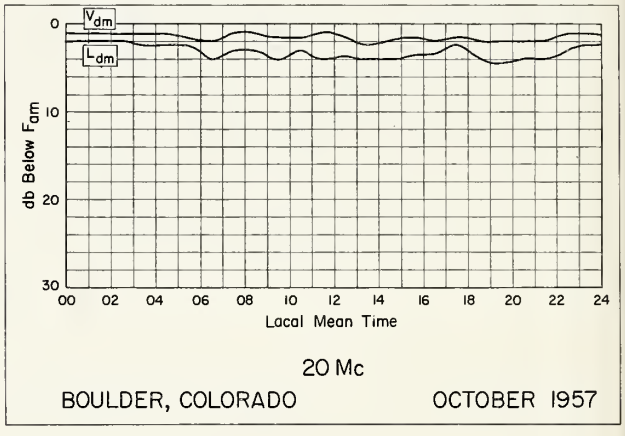
5 Mc

BOULDER, COLORADO OCTOBER 1957



10 Mc

BOULDER, COLORADO OCTOBER 1957



20 Mc

BOULDER, COLORADO OCTOBER 1957

EXAMPLE OF IONOSPHERIC VERTICAL SOUNDINGS
Okinawa; August 12, 1957
(Geomagnetic Latitude 15°N)

The following ionograms were obtained at the Showa Corp. Okinawa vertical sounding station. They are typical of day and night conditions for August at this geomagnetic latitude. Ionospheric data are scaled directly from these records onto the daily f-plot, a graph of frequency characteristics vs. time. The f-plot for the day represented by these soundings is found on the following page. Medians as found in the Tables of Ionospheric Data are calculated using hourly values taken from the f-plot or directly from the ionogram.

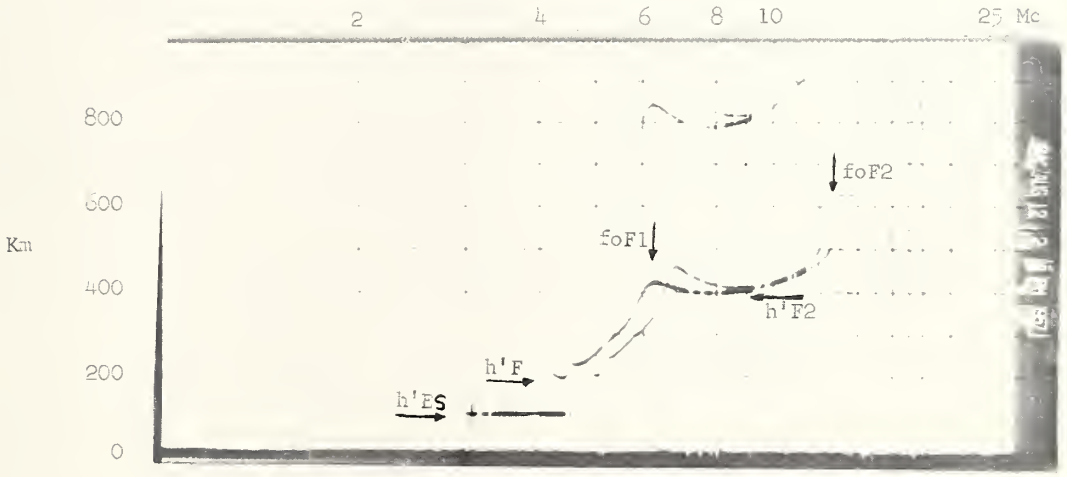


Fig. A. Okinawa, August 12, 1957, 1420 hours, 135°E time.

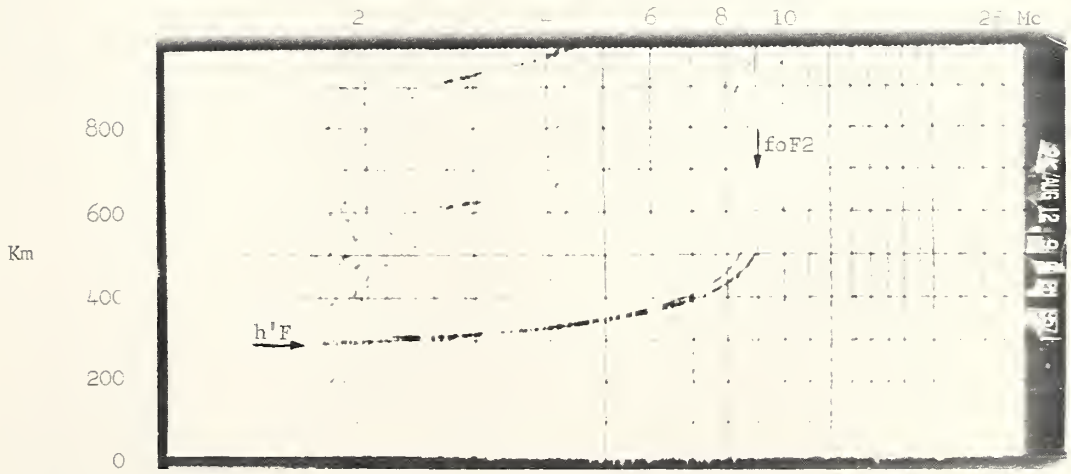
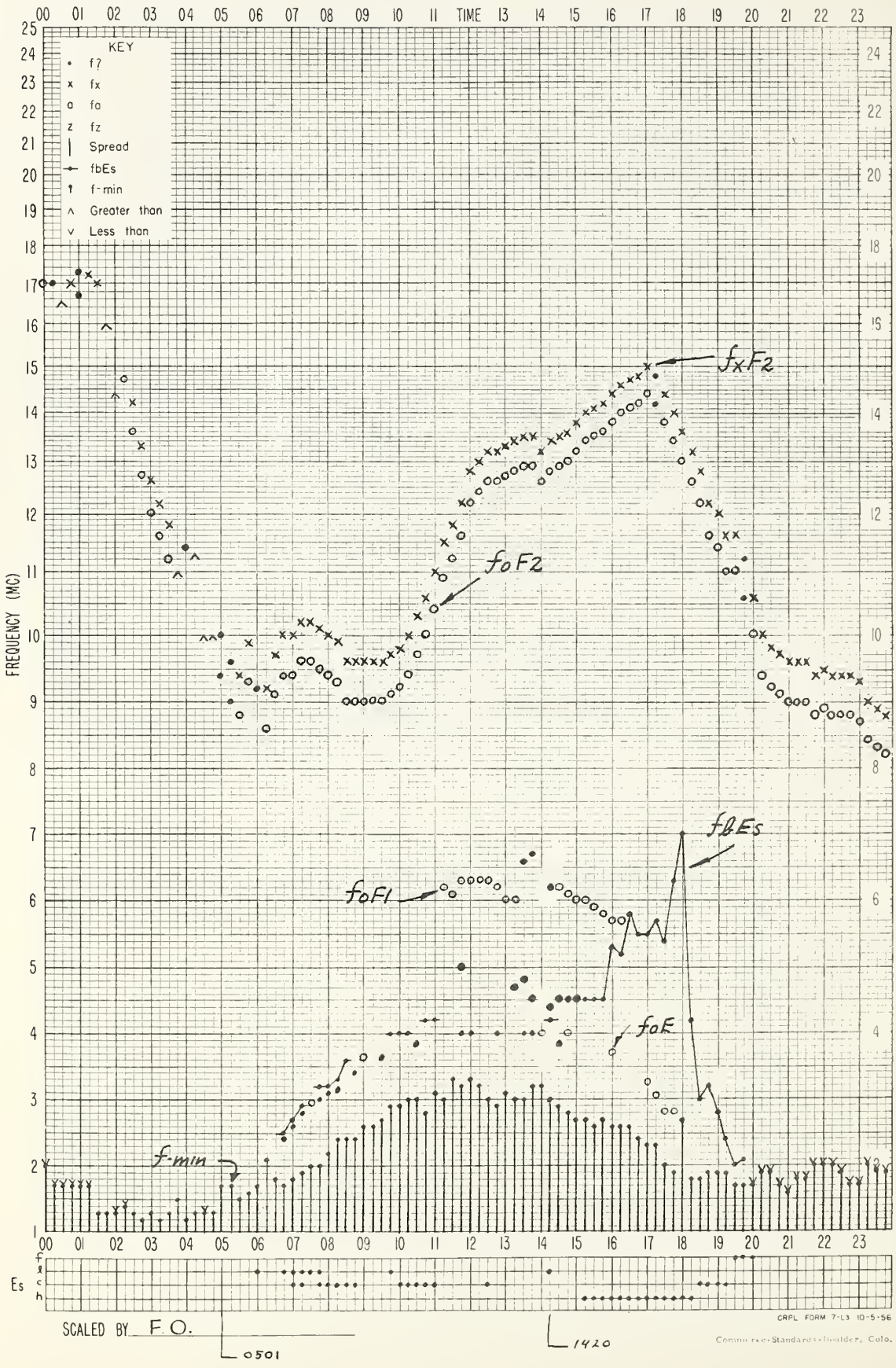


Fig. B. Okinawa, August 12, 1957, 2100 hours, 135°E time.

OKINAWA I.

STATION IONOK f-PLOT OF IONOSPHERIC DATA DATE 12 AUG 1957



SCALED BY F.O.

0501

1420

CRPL FORM 7-L3 10-5-56

Communication-Standards Boulder, Colo.

Table 1

Lycksele, Sweden (64.6°N, 18.8°E) October 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		6.3	365				3.0	2.4
01		6.1	350				2.4	2.4
02		6.0	330				2.3	2.5
03		6.1	320				2.3	2.5
04		6.2	280				2.0	2.5
05		5.5	270		---	E	2.0	2.6
06	---	6.2	250	---	---	E		2.7
07	---	7.8	255	---	120	1.75	1.9	2.8
08	---	10.0	240	---	110	2.20		2.9
09	---	11.1	235	---	105	2.50		3.0
10	---	12.3	230	---	105	2.80		3.0
11	---	12.6	230	---	105	2.90		3.0
12	---	13.0	225	---	105	2.90		2.95
13	---	12.6	230	---	105	2.85		3.0
14		13.0	230	---	105	2.60		3.0
15		12.7	230		105	2.30		3.0
16		12.0	230		125	1.95	2.0	3.0
17		11.4	230		---	E		2.9
18		9.5	230		---	E		2.8
19		7.6	250					2.8
20		6.2	285				2.2	2.6
21		6.1	320				2.6	2.5
22		6.7	320				3.4	2.5
23		6.2	350				3.0	2.4

Time: 15.0°E.
Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 2

Formosa, China (25.0°N, 121.5°E) October 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		14.9	240					2.90
01		13.2	230					2.85
02		10.4	230					2.90
03		8.4	220					2.95
04		6.9	230					2.70
05		6.3	<260					2.60
06		9.0	290			(1.8)	2.0	2.70
07		12.9	240			(2.8)	3.0	2.95
00		14.1	230			3.4	4.0	2.90
09		15.2	230			(3.9)	4.2	2.75
10		15.1	230			(4.2)	4.4	2.65
11	---	15.6	230	---		4.3	4.7	2.50
12	---	16.2	220	(7.6)		(4.3)	4.6	2.45
13	(440)	16.2	230	---		---	4.4	2.40
14	430	16.5	230	(7.4)		---	4.1	2.45
15	(420)	16.4	240	---		(3.8)	4.2	2.45
16	---	16.1	240			3.4	3.9	2.55
17		16.2	260			(2.4)	3.6	2.50
18		(16.6)	290			---	3.6	2.55
19		(17.9)	320				3.0	2.50
20		19.1	300				2.5	2.60
21		18.6	260					2.65
22		18.0	240				2.1	2.70
23		(17.6)	240					(2.80)

Time: 120.0°E.
Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

Table 3

Kiruna, Sweden (67.8°N, 20.3°E) September 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.6	360				(3.7)	2.5
01		5.2	345				(3.8)	2.4
02		5.0	350				(3.3)	2.5
03		5.0	330				2.2	2.5
04		5.0	315		---	---	(2.6)	2.55
05		5.0	290	---	---	1.8	2.0	2.65
06	---	5.8	265	---	---	2.1		2.7
07	---	6.5	260	---	120	2.5		2.7
00	---	7.0	250	---	110	2.8		2.7
09	---	8.0	245	4.7	110	3.0		2.7
10	---	8.5	240	5.0	110	3.0		2.7
11	---	8.7	240	4.9	110	3.1		2.6
12	---	8.5	240	5.0	110	3.1		2.6
13	(385)	8.6	240	4.7	110	3.0		2.7
14	---	8.2	245	4.2	110	2.9		2.7
15	---	7.4	250	---	115	2.8		2.8
16	---	7.4	250	---	---	2.7		2.8
17		7.6	255		---	2.0		2.8
18		6.5	280		---	1.8	2.8	2.8
19		6.8	290				3.0	2.7
20		5.9	290				(3.2)	2.65
21		5.6	320				(3.9)	2.6
22		5.2	345				(3.8)	2.5
23		5.9	350				(3.6)	(2.6)

Time: 15.0°E.
Sweep: 0.8 Mc to 14.0 Mc in 30 seconds.

Table 4

Lycksele, Sweden (64.6°N, 18.8°E) September 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.2	310				2.6	2.5
01		5.0	320				2.2	2.5
02		4.8	315				2.0	2.5
03		4.4	310				1.6	2.5
04		4.6	290		---	E		2.55
05	(300)	5.0	275	3.20	---	E		2.7
06	330	6.3	260	3.90	120	2.10		2.8
07	(260)	6.9	245	4.00	110	2.45		2.9
08	(330)	7.6	240	4.50	105	2.75		2.8
09	(280)	8.4	240	4.70	105	3.05		2.8
10	330	8.7	230	4.90	105	3.20		2.8
11	315	9.0	230	5.05	105	3.35		2.8
12	370	8.6	230	5.10	105	3.35		2.8
13	380	8.6	230	5.00	105	3.20		2.8
14	(420)	8.4	230	4.75	105	3.10		2.8
15	(350)	8.4	235	4.35	105	2.90		2.8
16	(375)	8.7	240	4.10	110	2.50		2.9
17	(340)	8.8	240	----	115	2.10	2.4	2.9
18	---	8.4	245	----	130	1.65	2.2	2.8
19		7.8	250		---	E	2.0	2.8
20		6.4	255		---	----	2.1	2.7
21		5.5	270				2.0	2.6
22		5.2	305				2.0	2.5
23		5.0	315				2.1	2.5

Time: 15.0°E.
Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 5

Nurmijarvi, Finland (60.5°N, 24.6°E) September 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		---					<2.5	----
01		(5.5)					<2.1	(2.55)
02		(5.0)					<2.0	(2.60)
03		(5.3)					<1.6	(2.60)
04		---					<1.4	----
05		(4.2)					<1.8	(2.60)
06		5.9						2.80
07		6.5		---				2.90
08		7.0		---		---		2.90
09		8.0		---		2.9		2.80
10		9.0		---		---		2.80
11		9.6		4.7		---		2.80
12		9.1		4.7		---		2.70
13		9.3		5.0		---		2.75
14		9.1		---		---		2.75
15		9.4		---		---		2.80
16		8.9		---		---		2.80
17		9.6				---		2.90
18		9.4				---		2.90
19		9.2				---		2.85
20		9.0				---	<2.6	2.90
21		8.2					<2.8	2.80
22		(7.5)					<2.6	(2.70)
23		(7.1)					<2.6	(2.70)

Time: 30.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 1 minute.

Table 6

Upsala, Sweden (59.8°N, 17.6°E) September 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.2	305				3.1	2.5
01		5.4	315				3.5	2.5
02		4.6	300				3.4	2.5
03		4.2	310				3.0	2.45
04		4.1	310		---	E	3.0	2.5
05	---	4.5	290	----	---	E	3.0	2.6
06	---	5.5	260	----	120	2.10	3.6	2.8
07	(530)	6.2	250	4.00	110	2.60	3.6	2.8
08	360	7.2	240	4.80	110	3.00	3.9	2.7
09	330	8.0	240	5.00	110	3.25	4.9	2.8
10	325	8.4	240	5.10	105	3.40	4.6	2.7
11	440	9.3	230	5.20	105	3.50	4.6	2.7
12	305	9.3	240	5.30	105	3.50		2.7
13	320	9.0	240	5.30	105	3.50	4.5	2.7
14	295	9.4	240	5.20	105	3.40		2.8
15	300	8.8	240	(5.20)	105	3.20		2.8
16	(420)	9.5	245	4.55	110	2.80	3.1	2.8
17	---	9.3	250	(4.10)	120	2.35	3.0	2.8
18		9.4	245		---	1.60	3.1	2.8
19		8.8	245		---	E	3.0	2.8
20		7.1	245		---	----	3.2	2.75
21		6.5	255				3.5	2.7
22		6.3	280				3.2	2.5
23		6.2	290				3.2	2.5

Time: 15.0°E.
Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 7

Graz, Austria (47.1°N, 15.5°E) 5eptember 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		7.0	340					
01		6.4	350					
02		6.4	345					
03		(5.8)	340					
04		(5.4)	340					
05		>4.9	325					
06		7.0	260					
07		8.6	260					
08		>9.4	250				3.6	
09		>9.8	250			3.7	3.8	
10		>9.5	250			3.8	3.9	
11	310	>9.6	250			3.8	4.0	
12	320	>9.4	250			3.8	3.9	
13	350	>9.5	250	(6.6)		3.7	3.7	
14	345	>9.5	250	(6.3)		3.7		
15		>9.5	250			3.6		
16		>10.0	260					
17		9.6	260					
18		>9.3	260					
19		9.4	270					
20		(8.4)	280					
21		(7.8)	290					
22		(7.3)	300					
23		>7.0	330					

Time: 15.0°E.
Sweep: 2.5 Mc to 11.5 Mc in 2 minutes.

Table 8

Schwarzenburg, Switzerland (46.8°N, 7.3°E) September 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	6.7						2.95
01	290	6.6						2.9
02	290	6.1						2.9
03	290	6.0						2.9
04	290	5.0						2.9
05	300	4.6						2.9
06	260	5.0			---	---		3.3
07	230	7.2	---	---	100	2.4		3.5
08	220	8.8	220	4.6	100	3.0		3.5
09	220	9.5	200	5.2	100	3.2		3.4
10	230	9.7	200	5.4	100	3.5		3.3
11	220	10.2	200	6.0	100	3.7		3.25
12	270	10.6	210	6.3	100	3.7		3.1
13	290	10.5	220	6.5	100	3.7		3.0
14	280	10.2	210	6.3	100	3.6		3.0
15	270	10.2	220	5.9	100	3.4		3.05
16	260	9.2	220	5.5	100	3.2		3.2
17	240	8.9	230	4.8	100	2.8		3.2
18	240	8.4	---	---	100	2.3	3.0	(3.2)
19	230	8.6						3.2
20	240	8.3						3.2
21	260	7.8						3.2
22	240	7.5						3.1
23	270	6.6						3.0

Time: 15.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 9

Formosa, China (25.0°N, 121.5°E) 5eptember 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		14.4	260				3.6	2.80
01		13.7	250				2.7	2.95
02		11.0	240				2.6	2.95
03		8.7	230				2.2	2.70
04		7.4	240				2.5	2.80
05		6.3	250				2.3	2.80
06		9.0	260			(2.1)	2.4	2.95
07		11.5	240			---	3.8	3.10
08		11.9	230			(3.6)	4.4	3.00
09		12.8	230			(4.0)	5.2	2.75
10		13.9	230			---	5.7	2.65
11	---	15.1	230	---		---	5.1	2.65
12	---	16.1	(230)	---		---	5.6	2.60
13	(400)	16.9	(230)	---		---	5.0	2.55
14	(400)	17.5	230	---		(4.2)	5.0	2.55
15	(380)	17.3	240	---		4.0	5.0	2.60
16	---	17.0	240			3.6	4.8	2.65
17	---	17.0	260			(3.1)	4.4	2.65
18		17.1	260			---	4.2	2.70
19		>17.0	280				4.0	2.60
20		17.2	280				3.6	2.65
21		16.3	270				3.4	2.60
22		16.4	280				3.6	2.65
23		15.0	270				3.6	2.75

Time: 120.0°E.
Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

Table 10

Tromso, Norway (69.7°N, 19.0°E) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.3	330				4.1	(2.40)
01		5.4	340		---	2.10	4.0	2.40
02	---	5.9	(325)		---	----	4.0	2.45
03	---	5.7	290		110	1.65	3.5	2.55
04	---	6.0	280	----	110	1.90	2.8	2.70
05	---	6.1	255	----	105	2.40	2.8	2.70
06	---	6.6	250	4.20	105	2.75		2.70
07	(445)	6.8	245	4.50	105	2.95		2.60
00	395	6.8	240	4.70	105	3.15		2.70
09	470	7.0	240	4.80	105	3.20	3.4	2.60
10	405	7.0	235	5.10	105	3.35		2.60
11	400	7.1	220	4.95	100	3.45	3.5	2.70
12	405	7.0	225	5.00	100	3.40		2.70
13	(400)	7.1	220	5.00	105	3.40		2.70
14	---	6.9	230	4.95	105	3.35		2.70
15	---	6.8	240	4.80	100	3.20		2.70
16	---	7.0	245	----	105	3.10		2.70
17	---	6.9	250	----	105	2.90	3.1	2.80
18	---	6.5	250	----	110	2.60	2.9	2.80
19	---	6.3	255	----	115	2.30	3.0	2.75
20	---	6.4	260	----	110	1.95	3.6	2.70
21		5.8	295		115	1.80	3.0	2.55
22		5.8	325		---	----	3.2	2.55
23		5.6	340		---	----	3.6	2.50

Time: 15.0°E.
Sweep: 0.7 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 11

Anchorage, Alaska (61.2°N, 149.9°W) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		4.4						2.65
01		(4.4)						(2.55)
02		4.3						2.50
03		4.3						2.50
04		4.6		---	---	----		2.50
05		5.2		3.4	125	(2.15)		2.60
06		5.8		4.0	119	(2.50)		2.55
07		6.1		4.5	116	2.85		2.50
00		6.3		4.6	111	3.05		2.55
09		6.5		4.9	109	(3.20)		2.50
10		6.8		5.0	107	3.40		2.50
11		6.6		5.1	109	(3.50)		2.50
12		6.8		5.2	109	(3.50)		2.55
13		7.0		5.0	109	(3.50)		2.60
14		6.8		5.2	108	(3.40)		2.55
15		6.8		(4.8)	109	3.30		2.65
16		6.8		4.8	109	(3.05)		2.70
17		7.0		4.6	109	(2.85)		2.75
18		6.8			111	2.45		2.85
19		6.8			<131	2.20		2.90
20		6.6						2.80
21		6.0						2.75
22		5.5						2.65
23		4.9						2.65

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 12

Oslo, Norway (60.0°N, 11.1°E) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.0	300					2.50
01		6.2	300				2.6	(2.60)
02		5.3	300				2.8	2.55
03		4.6	300		---	----	2.5	2.55
04		4.5	290		---	----	2.3	2.55
05		5.3	270		---	1.85	2.5	2.70
06	---	5.9	250	----	100	2.40	3.0	2.75
07	---	6.7	240	----	100	2.75	3.4	2.75
00	(480)	7.0	245	4.60	100	3.10	3.5	2.75
09	(440)	7.6	240	5.10	100	3.30	4.0	2.70
10	(450)	7.6	230	5.10	100	3.60	4.2	2.70
11	440	7.6	220	5.15	100	3.65	3.9	2.75
12	460	8.0	215	5.15	100	3.65	3.9	2.70
13	(490)	7.9	215	5.20	100	3.70		2.70
14	(475)	7.7	215	5.20	100	3.65	3.7	2.70
15	---	7.7	225	----	100	3.55	3.6	2.70
16	---	7.8	240	----	100	3.30	3.5	2.70
17	---	7.8	250	----	100	3.05		2.75
18		7.7	250		105	2.65	3.0	2.80
19		7.7	255		---	2.25	2.8	2.80
20		7.5	260		---	----	2.6	2.80
21		7.0	260				2.9	2.70
22		>6.8	280				2.9	2.60
23		6.3	300				3.0	2.55

Time: 15.0°E.
Sweep: 0.7 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 13

De Bilt, Holland (52.1°N, 5.2°E) August 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	6.2					2.2	2.65
01	300	6.0					2.2	2.65
02	300	5.5						2.70
03	290	5.1						2.75
04	280	5.0			---	---		2.80
05	250	5.6	245	---	120	2.0	2.5	3.00
06	(300)	6.6	230	4.2	105	2.6	3.5	3.10
07	370	7.2	220	4.7	105	3.0	4.0	3.00
08	335	7.8	220	5.0	105	3.3	4.2	2.95
09	310	8.4	210	5.1	105	3.5	4.8	2.95
10	310	8.7	205	5.5	105	3.6	4.2	2.95
11	345	8.4	205	5.5	105	3.8	4.0	2.90
12	355	8.3	205	5.5	105	3.9		2.85
13	350	8.1	205	5.6	105	4.0		2.85
14	375	8.0	215	5.5	105	3.8		2.90
15	340	8.0	215	5.2	105	3.6		2.90
16	(350)	8.0	225	5.0	105	3.3	3.4	2.90
17	---	8.0	230	---	105	2.9	3.6	3.00
18	250	8.1	240	---	115	2.4	3.5	3.00
19	250	8.0			---	---	3.5	3.00
20	250	7.9						2.95
21	250	7.3						2.85
22	270	6.9						2.75
23	300	6.5						2.65

Time: 0.0°.
Sweep: 1.4 Mc to 16.0 Mc in 40 seconds.

Table 14

St. John's, Newfoundland (47.6°N, 52.7°W) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.7	300					2.60
01		5.0	300					2.60
02		5.0	300					2.60
03		4.0	290					2.65
04		4.0	290		---	----		2.80
05		5.0	260		118	2.10		3.00
06	(390)	5.9	230	4.2	111	2.70		3.00
07	(380)	6.4	230	4.5	109	3.10		3.00
08	430	6.6	220	4.9	109	3.40		3.00
09	440	6.7	220	5.0	107	3.50	3.6	2.80
10	430	6.9	210	5.3	105	3.75		2.80
11	450	7.0	210	5.4	105	3.95		2.75
12	425	7.0	210	5.5	105	4.00		2.70
13	450	7.1	220	5.4	103	3.90		2.70
14	425	7.2	220	5.4	105	3.60		2.70
15	415	7.4	220	5.2	105	3.50		2.70
16	(385)	7.6	230	4.9	109	3.15		2.70
17	---	7.8	240		111	2.70		2.80
18	---	7.6	260		119	2.20	2.6	2.80
19		7.3	270				2.1	2.80
20		7.5	270				2.7	2.70
21		6.9	290				2.5	2.65
22		6.7	280					2.60
23		6.1	300					2.60

Time: 60.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 15

Ottawa, Canada (45.4°N, 75.9°W) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.4	290				<1.7	2.6
01		4.8	300				<1.7	2.6
02		4.5	300				<1.7	2.6
03		4.0	300				<1.7	2.6
04		3.8	300				<1.7	2.6
05		4.2	290		---	1.8		2.8
06	(280)	5.3	250	---	115	2.5		3.0
07	330	6.1	240	4.4	110	3.0		3.0
08	340	6.4	220	4.8	105	3.3		2.8
09	360	7.0	220	5.0	105	3.6		2.8
10	400	6.9	220	5.2	105	3.9		2.7
11	440	7.0	200	5.3	105	4.0		2.6
12	420	7.0	210	5.4	105	4.0		2.7
13	420	7.3	220	5.3	105	4.0		2.6
14	400	7.1	220	5.5	105	3.9		2.6
15	400	7.2	220	5.2	105	3.8		2.6
16	380	7.2	230	5.0	105	3.5		2.6
17	340	7.4	240	4.9	110	3.0		2.7
18	300	7.4	250	4.0	120	2.6		2.7
19	---	7.3	270		120	1.9		2.8
20		7.2	260				<1.7	2.6
21		7.0	270				<1.6	2.7
22		6.3	280				<1.7	2.7
23		5.9	290				<1.7	2.7

Time: 75.0°W.
Sweep: 1.0 Mc to 16.0 Mc in 16 seconds.

Table 16

Washington, D. C. (38.7°N, 77.1°W) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.0	285				3.2	2.70
01		5.8	285				4.0	2.70
02		5.4	290				3.4	2.65
03		5.1	280				2.8	2.70
04		4.8	280				3.0	2.70
05		4.5	280					2.80
06	---	5.8	255	---	119	2.20		3.00
07	290	6.5	240	---	111	2.80	3.0	3.05
00	290	6.7	230	4.7	109	3.20	3.6	3.00
09	375	7.0	220	5.3	105	(3.50)	3.7	2.80
10	415	7.7	205	5.4	105	(3.80)	3.8	2.75
11	410	7.5	200	5.4	105	(3.95)		2.70
12	420	7.8	210	5.6	105	4.00		2.65
13	400	7.6	210	5.6	105	4.00		2.65
14	405	7.8	220	5.5	105	3.90		2.65
15	385	7.7	220	5.4	105	3.75		2.70
16	360	7.6	225	5.0	108	3.45		2.70
17	350	7.6	235	---	109	3.00	3.1	2.75
18	280	7.7	250		119	2.50	2.7	2.80
19		7.6	260		---	----	2.0	2.85
20		7.4	250				3.5	2.70
21		7.2	270				3.0	2.70
22		6.8	280				3.2	2.70
23		6.5	<280				3.1	2.65

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 17

White Sands, New Mexico (32.3°N, 106.5°W) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.0	<300				3.2	2.60
01		6.1	300				3.4	2.60
02		5.8	290				2.7	2.65
03		5.7	280				2.9	2.70
04		5.6	<280				2.7	2.70
05		5.3	<280		---	----	3.0	2.80
06		6.4	255		119	2.10	2.4	3.00
07	(385)	7.6	240	---	111	(2.90)	3.1	2.95
08	---	8.4	220	5.3	109	(3.30)	3.9	2.85
09	355	9.1	210	5.8	109	(3.70)	4.1	2.70
10	370	9.6	210	5.8	108	(3.90)	4.2	2.65
11	370	9.8	210	5.9	107	(3.95)	4.1	2.60
12	380	10.1	210	5.9	109	(4.05)	4.5	2.60
13	380	10.3	220	5.8	109	(4.00)	4.1	2.60
14	370	10.3	220	5.8	109	(3.95)	4.2	2.65
15	355	10.0	225	5.7	109	(3.80)	4.0	2.65
16	360	9.7	230	5.2	109	(3.50)	3.8	2.70
17	---	9.2	240	---	111	3.10	3.4	2.80
18		8.9	<260		117	2.60	2.8	2.85
19		8.6	250				2.9	2.90
20		7.7	245				3.2	2.75
21		7.0	250				3.1	2.75
22		6.4	<275				3.4	2.65
23		6.1	<280				3.2	2.60

Time: 105.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 18

Okinawa I. (26.3°N, 127.8°E) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		>11.4	280				(3.6)	2.65
01		11.8	280				4.2	2.70
02		>11.0	270				(3.1)	(2.80)
03		10.0	240				2.5	2.80
04		8.4	245				(2.6)	2.85
05		7.8	250				(3.7)	2.85
06		7.8	260				2.3	3.00
07		9.0	240		113	2.65	2.8	3.15
00	---	9.4	230		111	(3.25)	4.0	3.15
09	---	9.4	220		111	(3.70)	5.0	2.95
10	---	10.0	210	---	111	(3.90)	5.1	2.65
11	385	11.2	215	6.2	(111)	(4.10)	5.2	2.60
12	375	12.4	220	6.4	(110)	(4.15)	5.6	2.60
13	370	12.9	215	6.3	(111)	(4.15)	5.3	2.65
14	370	13.2	230	6.0	(111)	(4.10)	5.2	2.65
15	360	13.6	230	6.0	111	(3.95)	5.1	2.65
16	340	13.9	240	5.8	109	3.70	4.8	2.75
17	320	14.0	240		(111)	(3.25)	4.7	2.80
18	(290)	13.9	260		113	2.65	4.8	2.85
19		13.4	265				3.7	2.90
20		>13.1	270				4.8	2.70
21		13.1	280				3.6	(2.60)
22		>13.2	<290				3.1	(2.55)
23		11.3	290				3.0	2.60

Time: 135.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 19

Puerto Rico, W. I. (18.5°N, 67.2°W) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		8.9	290				(2.9)	2.75
01		8.6	275				(3.1)	2.85
02		8.0	250				3.6	2.90
03		7.2	250				(3.2)	2.75
04		6.9	270				(3.0)	2.80
05		6.4	260				(2.8)	2.90
06		6.8	270		---	----		2.90
07	---	7.6	245		115	(2.40)		3.10
00	---	8.8	230	---	109	3.15	3.3	3.05
09	(280)	9.1	220	---	109	(3.60)	3.9	2.90
10	340	10.0	220	5.8	109	(3.85)	4.2	2.75
11	360	10.9	215	5.8	109	(4.00)	4.4	2.70
12	360	11.5	215	5.8	109	(4.15)	4.5	2.70
13	350	11.5	220	5.7	109	(4.20)	4.4	2.70
14	350	11.4	220	5.8	109	(4.10)	4.4	2.70
15	360	11.1	220	5.5	111	3.95	4.4	2.65
16	350	11.1	230	5.6	111	3.65	4.2	2.70
17	325	10.8	240	5.0	115	3.20	3.8	2.70
18	(290)	10.1	255		117	(2.45)	3.2	2.80
19		9.6	260		---	----	2.7	2.80
20		9.3	(260)				3.8	2.70
21		9.2	280				3.1	2.65
22		8.9	295				(2.8)	2.60
23		8.8	300				(3.7)	2.65

Time: 60.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 20

Watheroo, W. Australia (30.3°S, 115.9°E) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		(5.1)	<250					(3.25)
01		(5.1)	<250					(3.05)
02		>4.8	<250					(3.25)
03		4.8	240					3.30
04		(4.3)	<225					(3.10)
05		3.7	<250					3.20
06		3.7	<245					3.25
07		6.7	230		110	1.85		3.60
00		8.5	225		105	2.80		3.60
09		10.2	220		105	3.20		3.45
10	---	11.0	230	---	105	3.50		3.40
11	(250)	11.1	225	5.0	100	3.60		3.40
12	250	11.0	225	5.2	100	3.60		3.30
13	(250)	11.0	230	5.1	110	3.60		3.20
14	(300)	10.6	240	5.9	110	3.60		3.20
15	---	10.6	235	---	110	3.45	3.4	3.20
16	---	10.5	220	---	110	3.15	3.2	3.20
17		>9.6	230		110	2.60		(3.35)
18		---	225		150	1.65		
19		>7.1	215					(3.35)
20		7.0	220					<3.35
21		6.5	230					3.25
22		5.8	235					3.20
23		(5.2)	250					(3.25)

Time: 120.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 45 seconds.

Table 21

Thule, Greenland (76.6°N, 68.7°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00	(430)	5.8	240	---	109	2.30		2.80
01	(500)	5.6	240	3.5	109	2.30		2.80
02	----	5.6	240	---	106	(2.40)		2.70
03	G	5.6	240	3.9	103	(2.50)		2.85
04	(460)	5.9	230	4.1	101	2.70		2.70
05	460	5.5	225	4.2	101	(2.80)		2.60
06	540	5.5	225	4.3	101	3.00		2.65
07	450	(5.8)	215	4.5	101	3.10		2.60
08	450	5.6	215	4.7	101	3.20		2.50
09	460	5.8	215	4.7	101	(3.30)		2.65
10	470	6.0	210	4.6	101	3.35		2.50
11	460	5.9	210	4.8	101	3.40		2.50
12	480	6.0	210	4.7	101	3.40		2.35
13	480	6.0	210	4.8	101	(3.40)		2.60
14	460	5.9	210	4.8	101	3.30		2.60
15	460	6.0	215	4.7	101	3.20		2.50
16	440	5.9	215	4.6	101	3.10		2.55
17	460	5.8	220	4.4	101	3.00		2.55
18	470	5.8	225	4.4	101	2.95		2.60
19	410	6.0	230	(4.2)	101	(2.80)		2.70
20	(380)	6.0	230	---	107	2.60		2.75
21	(470)	5.9	235	---	109	2.50		2.65
22	---	5.9	245	---	109	(2.30)		2.80
23	(430)	5.8	240	3.5	109	2.30		2.70

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 22

Baker Lake, Canada (64.3°N, 96.0°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.9	290		130	1.5	4.2	----
01		5.4	280		130	1.5	5.0	
02		5.4	290		120	1.5	3.8	----
03	---	5.3	290	---	110	1.8	3.4	----
04	---	5.3	270	---	110	2.1	4.0	----
05	400	5.3	260	3.8	110	2.4	4.0	----
06	360	5.6	240	4.2	110	2.8	5.0	----
07	470	5.7	220	4.5	105	3.1	5.0	----
08	500	5.6	220	4.7	100	3.4	4.1	----
09	470	5.8	210	4.8	100	3.6	5.0	----
10	520	5.9	220	4.9	100	3.8	5.0	G
11	500	6.2	220	5.0	100	3.8	5.0	2.55
12	500	6.4	210	5.0	100	3.9	5.0	2.55
13	480	6.5	220	5.1	100	3.8	5.0	2.6
14	470	6.7	210	5.0	100	3.8	3.8	2.6
15	440	6.7	210	5.0	100	3.8		(2.65)
16	440	6.5	220	4.9	100	3.5		----
17	410	6.4	220	4.8	100	3.3		----
18	400	6.2	220	4.7	100	3.1	4.5	(2.5)
19	400	6.1	240	4.3	110	2.8	4.5	
20	(350)	6.0	270	4.0	115	2.5	4.4	
21		6.0	290		120	2.1	5.5	----
22		5.9	300		115	1.9	7.3	----
23		5.8	280		---	1.6	6.6	

Time: 90.0°W.
Sweep: 1.0 Mc to 16.0 Mc in 16 seconds.

Table 23

Oslo, Norway (60.0°N, 11.1°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.5	310					2.50
01		6.5	310		---	----	2.4	2.45
02		6.3	315	----	---	----	2.8	2.40
03	---	5.8	300	----	---	----	2.6	2.55
04	---	6.0	275	----	---	2.00	2.4	2.55
05	---	6.5	250	----	100	2.35		2.55
06	(500)	6.5	250	4.40	100	2.80	3.2	2.55
07	(500)	6.5	240	4.45	100	3.10	3.8	2.55
00	460	6.0	240	5.00	100	3.30	4.0	2.55
09	460	7.0	240	5.10	100	3.60	4.0	2.55
10	445	7.3	215	5.20	100	3.65	4.2	2.55
11	440	7.3	215	5.35	100	3.80	4.4	2.55
12	470	7.4	215	5.50	100	3.80	4.0	2.45
13	500	7.4	215	5.35	100	3.80	3.8	2.50
14	460	7.4	215	5.40	100	3.80	3.8	2.55
15	470	7.2	215	5.20	100	3.70		2.55
16	(465)	7.2	215	5.15	100	3.60		2.55
17	(500)	7.3	245	4.85	105	3.30		2.70
18	---	7.5	250	----	105	3.00	3.2	2.70
19		7.2	250		---	2.65	3.0	2.70
20		7.0	265		---	2.30	2.6	2.75
21		6.9	270		---	2.00		2.70
22		6.9	295		---	----	1.4	2.70
23		6.9	300		---	----		2.55

Time: 15.0°E.
Sweep: 0.7 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 24

Churchill, Canada (50.8°N, 94.2°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.3	300		---	1.2	6.0	
01		5.3	300		---	1.2	5.3	
02		5.0	330		145	1.3	6.0	
03		5.0	320		120	1.6	4.5	
04	---	5.0	320	---	110	2.2	4.9	---
05	420	5.2	290	3.8	105	2.8	4.5	---
06	420	5.6	270	4.2	100	3.0	4.4	---
07	500	5.8	250	4.5	100	3.4		(2.5)
08	500	6.0	250	4.9	100	3.8		2.6
09	490	6.2	230	5.0	100	3.8	3.8	2.6
10	520	6.2	220	5.1	100	3.8		2.4
11	480	6.4	220	5.2	100	3.9		2.5
12	490	6.5	210	5.2	100	3.9		2.5
13	500	6.5	210	5.2	100	3.9		2.5
14	500	6.6	220	5.2	100	3.0		2.5
15	480	6.9	220	5.0	100	3.7		2.55
16	480	6.6	230	5.0	105	3.6		2.5
17	420	6.8	240	4.8	105	3.3		2.5
18	400	6.5	260	4.5	110	3.2		(2.55)
19	400	6.2	200	4.2	110	3.0		(2.7)
20	---	6.0	300	---	120	3.0	3.2	(2.7)
21	---	6.0	310		120	2.8	3.4	(2.7)
22		5.8	300		130	2.4	5.0	---
23		5.5	310		120	2.0	8.3	

Time: 90.0°W.
Sweep: 1.0 Mc to 17.0 Mc in 16 seconds.

Table 25

Ottawa, Canada (45.4°N, 75.9°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.9	290				<1.7	2.6
01		5.3	300				<1.7	2.6
02		4.9	300				<1.7	2.6
03		4.4	290				<1.7	2.6
04		4.2	300				<1.7	2.7
05	---	5.0	270		120	2.0		2.8
06	340	5.7	250	4.2	110	2.7		2.8
07	350	6.0	230	4.8	105	3.1		2.7
08	410	6.4	220	5.0	105	3.5		2.6
09	420	6.4	210	5.2	105	3.8		2.6
10	460	6.4	210	5.2	105	3.9		2.4
11	480	6.6	210	5.4	105	4.0		2.6
12	500	6.4	210	5.4	105	4.0		2.5
13	500	6.6	210	5.4	105	4.0		2.5
14	470	6.8	220	5.4	105	4.0		2.5
15	460	6.9	220	5.3	105	3.9		2.5
16	450	6.9	230	5.2	105	3.8		2.55
17	400	7.1	240	4.9	110	3.4		2.6
18	350	7.2	250	4.3	110	2.9		2.6
19	(300)	7.2	270		120	2.3		2.7
20		7.2	270		---	1.8	<2.1	2.7
21		7.2	280				<1.7	2.7
22		6.9	280				2.4	2.7
23		6.4	280				<1.7	2.65

Time: 75.0°W.
Sweep: 1.0 Mc to 16.0 Mc in 16 seconds.

Table 26

Ft. Monmouth, New Jersey (40.3°N, 74.1°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.6	<270				4.2	2.70
01		6.2	270				4.0	2.65
02		5.6	(260)				3.1	2.70
03		5.3	<270				3.1	2.65
04		5.0	270				3.1	2.70
05	---	5.4	265		<115	(1.95)	2.2	2.90
06	(420)	6.2	250	---	109	(2.60)	2.9	2.90
07	380	6.6	230	4.4	107	(3.15)	3.5	2.90
08	365	6.8	220	5.2	105	(3.50)	3.8	2.80
09	420	6.8	205	5.4	105	(3.65)	4.4	2.70
10	440	7.0	205	5.4	105	(3.90)	4.3	2.65
11	465	7.2	200	5.6	105	(4.00)	4.2	2.60
12	455	7.0	200	5.5	105	(4.00)	4.2	2.60
13	480	7.0	200	5.6	105	4.05	4.2	2.50
14	450	7.2	210	5.5	105	3.90	4.1	2.60
15	430	7.2	215	5.4	106	3.85		2.65
16	390	7.4	225	5.2	105	3.60		2.65
17	380	7.6	230	4.8	107	3.30		2.70
18	---	7.7	245		111	(2.70)	3.4	2.75
19		7.6	270		<125	(2.05)	3.0	2.80
20		7.7	250				4.2	2.75
21		7.4	<255				4.2	2.70
22		7.2	<270				3.7	2.70
23		7.0	275				3.6	2.70

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 27

Okinawa I. (26.3°N, 127.8°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		>11.1	310				3.2	2.60
01		11.2	285				3.1	2.70
02		10.1	260				3.2	2.80
03		9.5	255				3.1	2.80
04		8.3	260				4.1	2.80
05		7.3	260				3.8	2.75
06		7.9	255		(129)	2.00		3.00
07		8.4	240		111	(2.85)	3.3	3.00
00	---	8.4	230		109	(3.35)	4.7	2.95
09	---	8.8	220	---	109	(3.70)	5.6	2.80
10	(420)	9.2	220	6.3	109	(4.00)	5.2	2.55
11	410	10.1	215	6.2	109	(4.15)	4.9	2.50
12	400	10.9	215	6.1	109	(4.30)	5.1	2.55
13	400	11.3	210	6.2	109	4.25	5.2	2.55
14	400	11.9	220	6.1	110	(4.15)	5.0	2.55
15	390	12.4	225	5.9	109	4.00	5.2	2.60
16	360	12.8	230	5.7	109	3.75	5.2	2.65
17	330	12.6	235	---	109	3.40	4.5	2.70
18	(310)	12.2	250		111	2.85	4.7	2.70
19		11.6	270		(121)	----	4.4	2.70
20		10.7	300				4.2	2.55
21		(10.7)	325				3.1	2.45
22		10.8	330				3.1	2.45
23		11.2	320				3.0	2.50

Time: 135.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 28

Panama Canal Zone (9.4°N, 79.9°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		9.7	260				(2.2)	2.90
01		8.6	240					2.85
02		8.0	250					2.85
03		7.8	245				2.0	2.05
04		7.3	245					2.85
05		6.5	245				(3.0)	2.90
06		6.2	280		---	(1.65)		2.05
07		7.4	240		112	2.60	2.8	3.00
08		8.1	230		107	3.30	3.3	2.75
09	---	9.4	220	---	105	3.70	3.0	2.60
10	(410)	10.2	215	5.9	107	(4.00)	4.1	2.35
11	420	10.9	210	6.0	107	(4.20)		2.40
12	440	11.5	210	6.0	109	4.20		2.40
13	420	12.0	210	6.0	107	(4.20)	4.6	2.45
14	410	12.5	215	6.0	108	(4.10)	4.4	2.50
15	380	12.7	220	5.6	107	(4.00)	4.2	2.55
16	365	12.2	220	5.5	109	3.65	4.0	2.60
17	350	11.7	235	---	109	3.20	3.6	2.60
18	---	11.0	250		115	(2.50)	2.7	2.60
19		10.3	275				3.1	2.60
20		9.6	295				2.3	2.55
21		9.6	300					2.60
22		9.7	280				(2.6)	2.65
23		9.8	270					2.75

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 29

Townsville, Australia (19.3°S, 146.7°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		>5.7	240					3.05
01		4.6	245					2.95
02		4.2	250					2.95
03		3.9	250					3.05
04		3.6	280				2.1	2.75
05		3.7	260				2.1	2.90
06		4.0	250				2.1	3.00
07		>7.0	250		150	2.05	2.1	(3.20)
08	---	(10.8)	240		100	2.90		(3.30)
09	(240)	11.8	230		100	3.25		3.20
10	250	12.6	220		100	3.55		3.20
11	(250)	12.0	220	---	100	3.75	4.0	3.10
12	(250)	11.5	210	---	100	3.75	4.0	3.00
13	(320)	11.2	210	6.2	100	3.75	4.0	2.95
14	280	11.2	220	6.1	100	3.70	4.0	2.05
15	(290)	11.0	230	---	100	3.50	3.8	2.80
16	---	>11.0	230		100	3.15	3.6	(2.95)
17		>10.0	250		100	2.60	3.8	
18		>8.0	230		---	----	3.7	
19		7.7	230				3.2	3.10
20		7.0	240				2.1	2.90
21		(7.2)	250					(3.00)
22		>6.5	250					3.10
23		>6.0	240					3.00

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 30

Johannesburg, Union of S. Africa (26.2°S, 20.0°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		3.0	<295				<1.7	2.75
01		3.0	<305				<1.8	2.75
02		3.0	<270				<1.6	2.85
03		3.0	<250				<1.6	2.90
04		3.0	(250)				<1.7	2.85
05		2.7	<280				<1.6	2.05
06		2.9	<270				<1.7	2.90
07		6.1	240			---		3.10
00	---	9.0	230			2.7		3.25
09	(240)	10.3	225			3.2		3.20
10	250	11.4	225	---		3.6		3.15
11	250	11.7	220	---		3.8		3.05
12	260	11.2	220	---		3.8	4.0	2.95
13	270	11.1	220	---		3.8	4.1	2.85
14	270	10.9	215	4.9		3.7	3.9	2.85
15	---	11.0	225			3.4	3.8	2.80
16	(255)	10.9	240			3.0	3.3	2.85
17	---	11.0	235			2.4	3.0	2.95
18		9.5	220			---	2.6	3.00
19		7.3	220				2.3	3.10
20		5.6	230				2.0	3.15
21		4.2	<240				<1.0	3.10
22		3.7	240				<1.8	3.05
23		3.1	<270				<1.7	2.85

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 31

Brisbane, Australia (27.5°S, 152.9°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		4.9	260					2.65
01		4.8	268					2.70
02		4.7	260					2.75
03		4.7	250					2.75
04		4.4	240					2.75
05		4.0	250					2.70
06		4.3	258		---	E		2.80
07		8.0	230		140	2.20		3.15
08		10.7	230		110	2.88		3.15
09		12.8	230		110	3.38		3.15
10		12.8	238		118	3.50		3.15
11		11.8	220		118	3.65	3.8	3.00
12		11.8	220		118	3.78	4.8	2.90
13		11.0	228		115	3.70	4.0	2.85
14		11.8	238		115	3.55	4.0	2.80
15		10.8	230		120	3.30	3.4	2.85
16		10.2	240		120	2.78	3.2	2.85
17		9.6	240		120	1.95	3.7	2.95
18		8.5	238		---	E	3.2	2.85
19		7.2	230		---	---	2.2	2.75
20		6.6	258					2.75
21		6.8	250					2.75
22		5.6	250					2.88
23		5.2	240					2.80

Time: 150.0°E.
Sweep: 1.8 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 32

Canberra, Australia (35.3°S, 149.0°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		4.5	250					2.88
01		4.4	<288					2.75
02		4.4	278				1.8	2.80
03		4.4	275				1.7	2.80
04		4.6	255				1.9	2.95
05		4.0	<248				1.8	2.85
06		3.9	<250					2.90
07	---	5.6	240		---	<1.68		3.10
08	---	8.7	225	---	120	2.58		3.48
09	---	10.8	235	---	110	2.95		3.30
10	245	>11.2	230	(4.5)	110	3.38	3.4	3.20
11	(245)	11.6	220	(5.8)	118	3.58	3.5	3.15
12	(250)	>11.2	220	(4.6)	110	3.50	3.8	3.15
13	258	>11.1	220	(4.5)	118	3.50	3.8	3.00
14	(258)	>11.1	220	(4.6)	118	3.40	3.9	2.95
15	(250)	11.0	235	---	110	3.10	3.5	3.00
16	---	10.7	240	---	120	<2.98	2.8	3.00
17	---	10.1	230	---	125	1.90	2.3	3.10
18		8.6	220				2.1	3.18
19		>7.5	<248				2.2	3.00
20		6.6	<240					3.80
21		6.0	<250					2.90
22		5.2	<240					2.85
23		5.0	<260					2.80

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 33

Scott Base (77.8°S, 166.8°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		(4.9)	250					----
01		3.7	280					(3.10)
02		(3.8)	258				<1.1	----
03		(3.8)	270				<1.2	----
04		(3.4)	250					----
05		(3.4)	250				<1.5	(3.38)
06		(3.4)	250					(3.88)
07		(3.5)	240				<1.2	(3.30)
08		4.0	258				<1.3	----
09		4.2	258				<1.3	(3.20)
10		4.8	240				2.4	(3.30)
11		5.3	258				<1.9	(3.30)
12		6.0	240				3.0	(3.20)
13		7.0	250				5.3	(3.30)
14		6.6	258				<3.4	(3.20)
15		7.2	250				5.0	(3.28)
16		7.8	258				<1.4	(3.10)
17		7.8	258					(3.20)
18		7.3	258					(3.20)
19		7.5	250					(3.20)
20		6.6	250					----
21		6.9	250					2.78
22		5.9	250					----
23		(5.7)	250					----

Time: 165.0°E.

Table 34*

Inverness, Scotland (57.4°N, 4.2°W) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		7.0	315					2.27
01		7.0	320					2.27
02		6.9	335			(1.4)		2.25
03		6.3	330		(135)	1.75	1.9	2.3
04		6.3	300		120	2.00	2.0	2.4
05	(450)	6.3	288	(3.9)	115	2.45	2.6	2.5
06	430	6.4	255	4.6	118	2.98		2.55
07	455	6.9	245	5.0	105	3.35	3.4	2.45
08	475	7.1	240	5.5	105	3.58	3.9	2.5
09	458	7.3	245	5.5	105	3.65	4.2	2.45
10	465	7.8	220	5.5	100	3.80		2.5
11	485	7.1	235	5.6	100	4.05	4.2	2.45
12	505	7.2	238	5.6	100	4.00		2.40
13	505	7.1	240	5.6	100	3.95		2.35
14	485	7.3	230	5.6	100	3.90		2.35
15	475	7.2	270	5.5	100	3.75		2.4
16	445	7.3	245	5.4	105	3.65		2.45
17	418	7.5	250	5.2	105	3.40		2.5
18	385	7.4	265	4.9	110	3.18	3.4	2.55
19		7.4	270		115	2.70	3.1	2.55
20		7.3	275		130	2.28	2.7	2.55
21		7.1	298		145	1.75	2.0	2.45
22		7.0	310					2.3
23		7.2	315					2.35

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and foEs, which are median values.

Table 35

Juliusruh/Rügen, Germany (54.6°N, 13.4°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		7.7						2.40
01		7.4				E	1.3	2.45
02		7.2				E	1.2	2.45
03		6.8				1.25	1.8	2.45
04		6.8		---		1.60	2.2	2.50
05		7.1		4.0		2.35	2.7	2.50
06		7.2		4.6		2.85	3.6	2.55
07		7.4		4.0		3.20	3.7	2.50
08		7.6		5.4		3.40	3.9	2.45
09		7.9		5.5		3.78	5.1	2.50
10		7.8		5.6		3.78	4.5	2.50
11		7.6		5.6		3.80	4.5	2.50
12		7.6		5.6		3.80	5.1	2.50
13		7.5		5.8		(3.65)		2.45
14		7.6		5.6		3.65	5.6	2.55
15		7.4		5.5		3.55	4.1	2.55
16		7.4		5.4		3.50	3.8	2.55
17		7.5		5.0		3.35	4.7	2.60
18		7.5				2.95	4.4	2.65
19		7.6				2.45	4.6	2.65
20		7.6				1.80	3.8	2.70
21		7.6				----	2.8	2.60
22		7.8					2.3	2.45
23		7.6						2.45

Time: 15.0°E.
Sweep: 8.5 Mc to 20.0 Mc in 28 seconds.

Table 36*

Slough, England (51.5°N, 0.6°W) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		7.8	315					2.40
01		7.8	315				2.3	2.40
02		7.3	315				2.5	2.40
03		7.0	325				3.2	2.45
04		7.0	320		(130)	1.9	3.4	2.45
05		7.2	278		120	2.4	3.5	2.50
06	(455)	7.7	255	(4.4)	115	2.9	3.6	2.68
07	450	7.7	250	5.2	110	3.3	5.0	2.55
08	445	8.2	235	5.4	110	3.6	5.8	2.55
09	465	7.9	235	5.8	105	3.8	4.9	2.45
10	455	8.1	230	5.7	105	3.9	4.8	2.50
11	470	8.8	225	5.9	105	3.9	4.8	2.50
12	475	7.9	238	5.8	105	3.9	4.8	2.40
13	465	8.1	235	5.8	105	4.8	4.6	2.45
14	470	8.2	235	5.7	105	3.9	4.8	2.50
15	460	8.0	235	5.6	110	3.8	4.6	2.50
16	435	8.0	240	5.5	110	3.6	4.3	2.55
17	410	8.0	250	(5.3)	110	3.3	4.6	2.55
18		8.2	260		115	3.0	4.8	2.68
19		8.2	275		125	2.4	4.6	2.68
20		7.8	285			1.8	4.2	2.65
21		8.4	300				3.3	2.50
22		8.5	315				2.3	2.45
23		7.9	325				2.4	2.40

Time: 8.8°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2, foEs, and (M3000)F2, which are median values.

Table 37

Townsville, Australia (19.3°S, 146.7°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		>5.8	240					2.90
01		>5.0	240					(2.05)
02		4.4	250					2.95
03		4.0	240					3.00
04		3.6	250					2.00
05		3.6	265					2.00
06		3.7	250				2.1	3.00
07		7.4	240			2.10		(3.20)
08		>11.0	230			2.90		(3.30)
09	(240)	>12.0	230			3.35		3.20
10	---	(12.7)	225			3.60	3.7	(3.15)
11	---	>12.0	220			3.75	4.0	3.00
12	(300)	11.7	220	---		3.80	4.2	2.95
13	---	>11.5	210	---		3.75	4.2	2.85
14	---	11.8	220	---		3.70	4.3	2.00
15	---	11.5	230	---		3.50	4.0	2.80
16		>11.0	240			3.15	4.2	(2.00)
17		>10.0	240			2.60	4.6	
18		>8.0	250			----	4.1	
19		>7.5	230				4.0	----
20		>7.2	240				3.1	(2.90)
21		>7.2	250				2.8	(2.80)
22		>7.0	250					(2.95)
23		>6.3	235					(3.10)

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 38

Johannesburg, Union of S. Africa (26.2°S, 28.0°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		3.0	<310					2.70
01		3.0	<300					2.75
02		3.1	<290					2.80
03		3.0	<275					2.90
04		2.8	<275					2.90
05		2.8	<300					2.80
06		2.9	<280					2.85
07		6.5	250			2.0		3.10
00	---	10.0	230			2.7		3.25
09	240	11.4	230	---		3.3		3.15
10	240	12.3	225	---		3.6		3.10
11	240	12.6	220	---		3.8		2.95
12	(250)	12.1	220	---		3.8		2.90
13	245	11.6	220	---		3.0	4.0	2.00
14	(270)	11.5	220	---		3.6	4.0	2.75
15	(260)	11.4	240	---		3.4	3.6	2.80
16	---	11.2	235			2.9	3.2	2.80
17	---	11.0	235			2.2	2.6	2.90
10		9.0	220				2.7	3.00
19		7.0	220				2.1	3.10
20		5.8	225				2.1	3.15
21		4.4	240					3.25
22		3.5	<245					3.10
23		3.1	<280					2.00

Time: 30.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 7 seconds.

Table 39

Capetown, Union of S. Africa (34.1°S, 10.3°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		2.6	<330					2.60
01		2.8	<315					2.65
02		2.0	<300					2.70
03		2.8	<285					2.80
04		2.0	<290					2.80
05		2.8	<300					2.80
06		2.6	<290					2.75
07		2.9	<275					2.70
00		6.8	240			2.0		3.10
09	---	>9.6	235	---		2.7		3.25
10	240	11.0	235	---		3.2		3.15
11	(245)	12.0	230	---		3.4		3.00
12	240	12.4	230	---		3.6		2.95
13	(250)	>12.2	230	---		3.7	4.0	2.85
14	(250)	12.4	240	---		3.5	3.8	2.85
15	(250)	12.3	240	---		3.3	3.6	2.80
16	(255)	12.3	240			3.0	3.4	2.85
17		11.7	235			2.4	2.6	2.90
18		>10.4	220			---		3.05
19		8.0	220					3.00
20		6.3	230					3.15
21		4.2	230					3.25
22		2.7	<230					3.15
23		2.4	<310					2.75

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 40*

Inverness, Scotland (57.4°N, 4.2°W) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		7.2	315					2.3
01		6.8	330					2.3
02		6.5	325					2.3
03		6.4	325			(1.35)		2.35
04		6.0	300		130	1.7		2.5
05		6.3	265		115	2.25		2.6
06		6.7	255		110	2.65		2.7
07	(420)	7.2	240	(5.0)	105	3.05		2.65
00	(450)	7.6	240	(5.0)	105	3.3		2.6
09	415	8.0	240	5.3	105	3.5		2.5
10	430	8.0	235	5.6	100	3.65		2.3
11	430	8.0	230	5.6	105	3.85		2.5
12	415	8.1	230	5.7	100	3.9		2.5
13	430	8.1	235	5.8	105	3.85		2.5
14	420	7.9	235	5.7	105	3.8		2.5
15	395	7.9	230	5.6	105	3.75		2.55
16	395	8.1	240	5.4	105	3.5		2.55
17		8.0	245		105	3.25		2.6
18		8.2	255		105	2.9		2.65
19		0.2	260		115	2.5		2.7
20		8.0	275		130	1.95		2.7
21		>7.5	275			(1.7)		2.5
22		7.8	290					
23		7.6	305					

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and foEs, which are median values.

Table 41*

Slough, England (51.5°N, 0.6°W) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		7.4	400					2.40
01		7.1	320					2.40
02		7.0	320					2.35
03		6.5	315				2.0	2.40
04		6.7	305		130	1.6	3.2	2.50
05		7.1	270		115	2.1	3.2	2.60
06		7.2	250		115	2.8	3.4	2.65
07	(380)	0.0	245	(5.3)	110	3.0	4.0	2.65
00	375	8.5	235	4.8	105	3.4	4.5	2.55
09	385	0.5	245	5.7	105	3.7	4.7	2.55
10	405	8.7	225	5.9	105	3.8	4.8	2.50
11	425	8.8	225	5.9	105	3.8	4.7	2.50
12	430	9.0	215	6.0	105	3.8	5.1	2.45
13	375	9.1	230	6.0	105	3.9	4.8	2.50
14	395	9.0	235	5.8	105	3.8	4.5	2.50
15	395	8.0	235	5.7	105	3.7	4.3	2.55
16	(400)	0.8	240	(5.6)	105	3.5	4.2	2.55
17	(380)	0.6	245	(5.4)	110	3.3	3.0	2.60
10		0.5	255		115	2.0	3.6	2.60
19		8.7	270		125	2.1	3.5	2.65
20		8.6	270				3.1	2.60
21		8.4	285				2.8	2.50
22		0.2	285				2.4	2.45
23		7.9	305					2.45

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and foEs, which are median values.

Table 42

Rarotonga I. (21.2°S, 159.0°W) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		8.2	250					2.90
01		6.9	250					2.90
02		6.6	250					2.90
03		6.2	250					2.90
04		4.8	240					2.00
05		4.3	280					2.70
06		5.4	290					2.70
07		10.3	270		---	(2.3)		(3.00)
00		13.4	250		---	3.0	3.6	3.10
09		14.5	250		---	(3.4)	3.9	3.10
10	---	14.5	240		115	(3.7)	3.9	3.00
11	---	14.0	240		114	3.8	3.9	2.90
12	---	14.0	240		108	(3.9)	3.9	2.00
13	(350)	13.0	250	---	112	3.8	3.9	2.70
14	350	13.6	245	---	110	3.0	4.0	2.70
15	---	13.6	245	---	116	3.5	4.0	2.70
16	---	13.8	260		---	(3.3)	3.9	2.00
17		13.2	270		---	2.5	3.9	2.00
18		13.4	270				3.6	(3.00)
19		12.8	250				2.9	(2.90)
20		11.2	250				1.8	(3.00)
21		10.0	<250					2.90
22		9.2	250					2.80
23		0.5	250					2.90

Time: 165.0°W.
Sweep: 1.5 Mc to 20.0 Mc in 5 minutes, manual operation.

Table 43*

Inverness, Scotland (57.4°N, 4.2°W) April 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.8	350					2.30
01		5.5	365					2.30
02		5.2	360					2.10
03		4.9	315					2.20
04		4.9	325					2.40
05		5.4	290		130	1.7		2.50
06		5.8	265		125	2.2		2.60
07		6.3	255		110	2.65		2.65
00		7.2	250		110	3.05		2.70
09	(410)	7.8	240	(5.3)	105	3.40		2.60
10	395	0.2	235	(5.5)	105	3.55		2.60
11	415	8.6	230	(5.6)	105	3.70		2.50
12	420	9.0	230	(5.9)	105	3.75		2.50
13	420	9.0	235	(5.6)	105	3.75		2.50
14	415	0.8	240	(5.7)	105	3.65		2.50
15	390	8.9	240	(5.0)	105	3.55		2.60
16		9.4	245		110	3.30		2.60
17		9.4	250		110	2.95		2.65
18		9.5	255		115	2.55		2.75
19		8.7	260		140	2.05		2.75
20		8.1	260			(1.6)		2.65
21		7.2	280					2.45
22		6.7	305					2.35
23		6.4	340					2.30

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and fEs, which are median values.

Table 44

Juliusruh/Rügen, Germany (54.6°N, 13.4°E) April 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.8				E		2.50
01		(5.9)				E		(2.60)
02		5.8				E		(2.60)
03		(5.2)				E		(2.55)
04		(5.3)				E		(2.65)
05		5.7				1.7		(2.95)
06		5.5		---		2.2		3.00
07		6.6		---		2.7		2.90
00		7.4		4.2		3.1		2.80
09		9.4		(4.4)		3.4		2.80
10		10.0		5.3		3.5		2.75
11		10.9		---		3.6		2.70
12		10.8		---		3.6		2.65
13		10.8		---		3.6		2.65
14		10.8		5.8		3.5		2.70
15		10.4		---		3.4		2.70
16		10.3		---		3.2		2.75
17		10.4		---		2.7		2.75
18		9.7				2.2		2.85
19		9.5				1.7		2.90
20		(8.2)				---		(2.75)
21		7.0				---		2.65
22		6.3				---		(2.50)
23		6.2				---		2.35

Time: 15.0°E.
Sweep: 0.5 Mc to 20.0 Mc in 20 seconds.

Table 45*

Slough, England (51.5°N, 0.6°W) April 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	foEs	(M3000)F2
00	340	6.6						2.35
01	345	6.3					2.2	2.30
02	340	5.9					2.2	2.35
03	330	5.0					2.4	2.35
04	315	5.4					2.5	2.40
05	205	5.3			145	1.0	3.2	2.55
06	265	6.4			130	2.2	3.5	2.70
07	255	7.1	(255)		115	2.0	3.0	2.70
00	290	7.0	240	5.4	120	3.2	4.3	2.65
09	330	8.8	235	5.7	115	3.5	4.4	2.60
10	380	9.3	235	6.1	110	3.7	4.4	2.55
11	380	10.1	235	6.1	110	3.0	4.6	2.60
12	360	10.4	230	6.3	110	3.0	4.6	2.55
13	365	10.4	230	6.4	110	3.8	4.4	2.55
14	330	10.2	225	6.0	110	3.7	3.9	2.55
15	325	10.0	240	6.0	110	3.6	3.8	2.60
16	265	10.1	(245)	(5.6)	115	3.3	4.0	2.60
17	250	(10.4)			115	2.9	3.4	2.65
10	260	(10.1)			130	2.3	3.1	2.70
19	260	(9.6)			(150)	(2.0)	2.9	2.70
20	260	0.5						2.60
21	275	7.9						2.50
22	300	7.2						2.40
23	330	6.9						2.40

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and fEs, which are median values.

Table 46*

Singapore, British Malaya (1.3°N, 103.8°E) April 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		13.3	240					2.00
01		11.7	230					2.80
02		10.1	240					2.70
03		9.2	245					2.80
04		8.8	240				(1.1)	2.95
05		7.7	230				0.8	3.10
06		7.8	260			1.55	1.6	2.00
07		11.4	255		130	2.70	2.8	2.85
00		13.9	245		115	3.40		2.70
09		14.6	235		110	3.80		2.50
10		14.6	220		110	4.00		2.15
11		14.8	210		110	4.20		1.95
12		13.9	210		110	4.30		1.95
13		13.5	210		110	4.30		1.95
14		13.6	220		110	4.10		1.95
15		13.6	225		110	3.80		1.95
16		13.7	245		115	3.60		2.00
17		14.0	255		120	2.00		2.05
18		14.0	295		(150)	2.00	(2.6)	2.05
19		13.8	370				(2.3)	2.05
20		(14.0)	365				1.2	----
21		(13.9)	290				1.4	----
22		(14.6)	245				(1.4)	(2.50)
23		13.0	230				(0.8)	(2.65)

Time: 105.0°E.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and fEs, which are median values.

Table 47

Providenie Bay, U.S.S.R. (64.4°N, 106.6°E) March 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	400	4.8						2.2
01	360	5.2						2.2
02	380	5.2						2.3
03	380	5.6						2.2
04	350	5.4						2.3
05	350	5.7						2.3
06	300	5.0						2.5
07	270	6.3						2.5
08	260	7.0						2.7
09	260	7.3						2.7
10	250	8.2						2.7
11	250	0.4						2.9
12	250	8.5						2.9
13	250	8.6						2.8
14	250	0.6						2.8
15	250	0.0						2.0
16	250	8.8						2.9
17	250	8.7						2.0
18	250	0.7						2.7
19	260	0.0						2.6
20	270	6.2						2.6
21	290	5.3						2.4
22	330	4.8						2.3
23	350	4.5						2.2

Time: 180.0°E.
Sweep: 1.0 Mc to 10.0 Mc in 10 minutes, semiautomatic operation.

Table 40*

Inverness, Scotland (57.4°N, 4.2°W) March 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.2	340					2.35
01		5.4	345					2.35
02		4.9	350					2.30
03		4.6	345					2.25
04		4.4	340					2.20
05		4.1	310			----		2.35
06		4.8	285		(165)	1.60		2.50
07		6.0	265		130	2.00		2.80
00		7.2	250		120	2.55		2.85
09		0.8	250		110	3.00		2.85
10	---	9.6	240	---	110	3.15		2.75
11	250	10.9	230		110	3.30		2.70
12	---	11.0	235		110	3.40		2.70
13	---	11.4	235		110	3.35		2.65
14	---	11.2	245	---	110	3.30		2.65
15		11.2	245		110	3.15		2.70
16		11.4	255		115	2.90		2.70
17		10.8	250		125	2.50		2.70
10		10.3	260		140	2.05		2.70
19		8.9	260		---	(1.70)		2.75
20		>7.7	265					2.70
21		6.2	200					2.45
22		5.5	320					2.35
23		5.3	340					2.30

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and fEs, which are median values.

Table 49

Sverdlovsk, U.S.S.R. (56.7°N, 61.1°E) March 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	350	5.2						2.4
01	370	5.0						2.4
02	350	4.9						2.4
03	340	4.5						2.4
04	340	4.3						2.4
05	330	4.2						2.5
06	290	5.1			---	1.8		2.7
07	270	6.8			130	2.2		2.8
08	260	8.6	260	4.2	120	2.7		2.9
09	250	10.8	250	4.3	120	3.0		2.8
10	250	12.1	250	4.6	120	3.2		2.8
11	250	12.6	240	4.9	120	3.3		2.7
12	250	12.6	240	4.8	120	3.3		2.6
13	250	13.0	240	4.5	120	3.3		2.6
14	250	12.7	250	4.8	120	3.2		2.7
15	250	12.5	250	4.3	120	3.1		2.7
16	250	12.2			130	2.8		2.7
17	260	11.2			140	2.3		2.7
18	260	10.7			150	1.8		2.8
19	270	9.6						2.7
20	270	8.2						2.7
21	270	6.9						2.6
22	300	6.0						2.5
23	300	5.6						2.4

Time: 60.0°E.
Sweep: 1.5 Mc to 18.0 Mc in 10 minutes, manual operation.

Table 50

Irkutsk, U.S.S.R. (52.5°N, 104.0°E) March 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	(6.0)						(2.8)
01	300	(5.8)						(2.7)
02	290	(5.3)						(2.7)
03	300	(4.9)						(2.6)
04	300	(4.8)						(2.7)
05	290	(5.0)						(2.7)
06	260	(5.2)			---	(1.8)		(2.9)
07	230	(8.2)			110	2.3		3.1
08	230	9.8	220	(4.3)	110	2.8		3.0
09	230	11.2	210	(4.2)	110	3.1		3.0
10	230	12.4	220	(4.4)	110	3.3		2.9
11	240	(13.2)	200	(4.4)	110	3.4		2.9
12	240	13.4	210	(4.4)	110	3.5		2.9
13	240	13.2	210	(4.5)	110	3.5		2.8
14	250	12.8	210	(4.4)	110	3.4		2.8
15	230	12.7	220	(4.2)	110	3.2		2.8
16	240	12.2			110	2.9		2.9
17	230	(12.0)			110	2.4		2.9
18	230	11.2			130	1.9		2.9
19	230	10.4						2.9
20	230	9.2						2.9
21	240	(8.3)						2.8
22	250	(7.6)						2.8
23	260	7.1						2.8

Time: 105.0°E.
Sweep: 1.8 Mc to 16.0 Mc in 1 minute.

Table 51

Rostov-on-Don, U.S.S.R. (47.2°N, 39.7°E) March 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	6.8						2.4
01	320	6.4						2.4
02	320	6.0						2.5
03	330	6.0						2.3
04	320	5.4						2.4
05	330	5.1						2.4
06	300	5.3						2.7
07	250	7.0						2.8
08	240	9.0			120	2.7		2.8
09	240	9.2			120	3.2		---
10	240	9.5			120	3.4		---
11	240	9.8			120	3.6		---
12	240	9.4			120	3.7		---
13	240	9.6			120	3.7		---
14	240	9.6			120	3.6		---
15	240	9.4			120	3.5		---
16	240	9.3			120	3.2		---
17	240	9.4			120	2.8		---
18	250	9.4				2.3		---
19	250	9.0						---
20	240	8.1						2.8
21	250	7.6						2.8
22	270	7.2						2.5
23	310	7.0						2.4

Time: 45.0°E.
Sweep: 1.6 Mc to 10.0 Mc in 5 to 10 minutes, manual operation.

Table 52

Ashkhabad, U.S.S.R. (37.9°N, 58.3°E) March 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	6.8						2.5
01	320	6.7						2.6
02	310	6.5						2.5
03	300	6.3						2.6
04	290	6.1						2.6
05	290	5.8			---	1.1		2.6
06	280	6.1			---	1.4		2.7
07	250	8.6			120	2.2		3.0
08	240	10.8			110	2.9		3.0
09	240	12.6			100	3.4		2.8
10	250	13.6	230	4.9	100	3.5		2.9
11	240	14.0	220	5.0	100	3.7		2.8
12	250	14.0	220	6.5	100	3.9		2.7
13	260	13.8	230	6.8	100	3.9		2.6
14	250	13.2	230	7.0	100	3.8		2.6
15	280	13.0	230	6.5	100	3.6		2.7
16	250	12.6	250	6.2	100	3.3		2.7
17	250	12.4			110	2.8		2.8
18	250	12.2			120	2.3		2.9
19	230	10.6						2.9
20	240	8.8						2.7
21	250	8.3						2.7
22	270	7.9						2.6
23	280	7.4						2.6

Time: 60.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 10 to 15 minutes, manual operation.

Table 53*

Singapore, British Malaya (1.3°N, 103.8°E) March 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		11.7	220					2.65
01		10.7	250					2.60
02		10.2	255					2.65
03		10.4	255					2.80
04		9.6	230					2.95
05		8.1	235				1.0	3.00
06		6.3	255				1.4	2.80
07		9.9	250		130	2.6	2.7	2.90
08		11.6	245		120	3.3	3.4	2.60
09		12.8	230		110	3.8	3.9	2.25
10		13.5	215		110	4.1		2.10
11		13.2	210		110	4.2		1.90
12		13.0	210		110	4.3		2.00
13		13.1	210		110	4.3		1.95
14		13.3	210		110	4.1		2.00
15		13.6	220		110	3.9		2.00
16		13.7	240		115	3.5		2.00
17		13.9	250		115	2.9		2.05
18		13.7	290		(150)	1.95		2.05
19		13.4	380					2.00
20		>13.6	380					(2.05)
21		>14.0	300				1.2	----
22		13.5	250					(2.55)
23		13.2	230					2.65

Time: 105.0°E.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and fEs, which are median values.

Table 54*

Falkland Is. (51.7°S, 57.8°W) March 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.9	345				(2.6)	2.3
01		6.8	340				(1.9)	2.3
02		6.4	340				(1.8)	2.3
03		6.1	335					2.2
04		5.7	365					2.2
05		5.4	370					2.2
06		6.5	280		160	1.8		2.5
07		8.7	250		120	2.4	2.9	2.8
08		10.6	245		110	2.9	3.6	2.8
09		12.2	240		105	3.3	(4.3)	2.8
10		13.0	240		100	3.5	(4.7)	2.8
11		13.4	225		100	3.6	(4.6)	2.7
12		13.8	230		100	3.6	(4.7)	2.7
13		13.5	230		100	3.6	(4.5)	2.7
14		12.9	235		100	3.5	(4.1)	2.8
15		11.7	240		105	3.3	(3.5)	2.8
16		11.1	245		100	3.0	(3.4)	2.8
17		10.5	250		110	2.5	(2.9)	2.9
18		10.4	250		(135)	(2.1)	(2.6)	2.9
19		9.4	250				(2.6)	2.8
20		8.0	255				(2.6)	2.7
21		7.3	275				(2.5)	2.5
22		6.9	315				(2.5)	2.3
23		6.8	350				(2.4)	2.3

Time: 60.0°W.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and fEs, which are median values.

Table 55*

Inverness, Scotland (57.4°N, 4.2°W) February 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		3.8	325					(2.45)
01		4.4	345					(2.50)
02		3.9	340					(2.50)
03		>3.6	335					(2.50)
04		(3.2)	330					(2.40)
05		(3.1)	315					(2.50)
06		(3.6)	290					----
07		3.9	270		---	----		2.70
00		6.2	255		145	1.90		3.00
09		8.5	245		130	2.35		3.00
10		10.5	240		120	2.65		3.00
11		11.8	240		115	2.90		3.00
12		12.2	235		115	3.00		3.00
13		12.4	235		120	3.00		2.90
14		12.4	235		120	2.90		2.95
15		12.1	240		125	2.65		2.90
16		12.0	240		135	2.40		3.00
17		10.8	235		140	1.95		3.00
18		8.6	235		---	----		2.90
19		7.2	245					2.75
20		6.2	275					2.70
21		5.1	295					2.65
22		4.6	315					2.50
23		4.6	320					2.45

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and fEs, which are median values.

Table 56*

Ibadan, Nigeria (7.4°N, 3.9°E) February 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		<9.8	265				1.0	----
01		>10.1	250					----
02		10.7	240					2.80
03		10.0	235					----
04		0.1	225					----
05		5.5	220				1.6	3.35
06		(6.0)	255		---	1.55	3.2	----
07		9.7	240		120	2.70	5.4	3.10
00		11.8	230		110	3.25	10.0	2.70
09		12.8	220		110	3.70	10.2	2.30
10		12.3	210		105	3.95	14.0	2.20
11		>12.2	210		105	----	10.8	2.25
12		12.4	200		105	4.20	13.5	2.15
13		12.6	200		105	4.10	10.3	2.20
14		13.0	210		105	3.95	7.4	2.25
15		13.4	225		110	3.70		2.25
16		13.3	240		110	3.30	8.7	2.20
17		(12.9)	260		115	2.65	6.9	2.10
18		(12.2)	300		---	1.55	5.7	----
19		(10.3)	400					----
20		10.3	375					----
21		(10.0)	335					----
22		(9.8)	295					----
23		<9.5	265					----

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic operation.
*Average values except foF2 and foEs, which are median values.

Table 57*

Falkland Is. (51.7°S, 57.8°W) February 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		0.4	315				(2.2)	2.4
01		8.1	315				(1.8)	2.4
02		7.8	320				(1.9)	2.4
03		7.4	330					2.3
04		6.0	365					2.3
05		7.4	300		155	1.8		2.3
06		0.5	255		130	2.3	2.8	2.4
07		9.8	250		110	2.9	3.6	2.5
00		10.5	245		105	3.3	(4.3)	2.6
09		10.8	245		100	3.5	(4.8)	2.5
10		11.5	(235)		100	3.7	(5.3)	2.6
11		12.0	(225)		100	3.8	(5.7)	2.6
12		11.9	225		100	3.8	(5.3)	2.6
13		11.6	230		100	3.7	(4.6)	2.7
14		11.2	225		100	3.8	(4.2)	2.7
15		10.2	230		100	3.6		2.7
16		9.2	240		100	3.4	(3.7)	2.8
17		8.8	245		105	3.0		2.8
18		0.5	255		125	2.5	(3.0)	2.8
19		8.3	265		(135)	(1.8)	(3.0)	2.7
20		8.4	290				(3.2)	2.6
21		8.2	300				(3.3)	2.4
22		8.4	325				(2.7)	2.3
23		8.4	325				(2.6)	2.4

Time: 60.0°W.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes, automatic.
*Average values except foF2 and fEs, which are median values.

Table 58

Tromso, Norway (69.7°N, 19.0°E) November 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	---	----					3.2	----
01	(345)	----					4.0	----
02	(350)	----					3.2	----
03	(290)	(5.70)					3.2	----
04	(300)	(7.10)					2.6	(2.55)
05	285	5.90					1.8	2.50
06	260	4.80					1.6	2.55
07	250	5.10			---	----		2.50
08	255	5.95			---	----	1.8	2.70
09	255	8.00			---	----		2.70
10	250	9.20			---	----		2.70
11	245	11.50	250	---	---	----	1.8	2.70
12	245	12.05	250	---	---	2.30		2.80
13	240	11.75	---	---	---	2.00		2.90
14	240	11.75			---	1.90		2.90
15	245	10.60			---	----	1.6	2.90
16	240	9.20			---	----	1.8	2.80
17	250	5.90					2.7	2.70
18	(250)	5.20					2.6	2.70
19	(280)	(4.80)					2.9	(2.80)
20	---	(4.80)					3.5	(2.55)
21	---	----					3.6	----
22	---	----					3.2	----
23	---	----					3.6	----

Time: 15.0°E.
Sweep: 0.7 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 59

Lulea, Sweden (65.6°N, 22.1°E) October 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	---						
01	320	---						
02	310	---						
03	310	---						
04	310	---						
05	280	---						
06	270	---	---	---	---	1.7		
07	250	7.0	---	---	---	2.0		
08	250	>8.0	---	---	120	2.3		
09	(240)	>8.5	---	---	125	2.5		
10	240	>9.0	---	---	120	2.5		
11	240	>9.0	---	---	120	2.6		
12	240	>9.0	---	---	115	2.6		
13	240	>9.5	---	---	110	2.5		
14	235	>0.0	---	---	130	2.4		
15	230	>0.3	---	---	125	2.3		
16	230	>8.0	---	---	---	2.0		
17	240	>8.0			---	---		
18	240	>7.0			---	---		
19	240	>7.0						
20	250	>7.0						
21	250	---					2.0	
22	(270)	---					2.5	
23	(280)	---					2.0	

Time: 15.0°E.
Sweep: 1.5 Mc to 10.0 Mc in 9 minutes, automatic operation.

Table 60

Sao Paulo, Brazil (23.5°S, 46.5°W) October 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	17.8					<2.2	3.1
01	240	18.0					<2.0	3.3
02	220	14.5					<2.1	3.25
03	220	11.6					<2.1	3.0
04	240	9.7					<2.2	2.85
05	240	8.4					<2.1	2.85
06	240	9.5			---	<2.3	<2.7	3.0
07	230	11.0			115	2.8	3.2	2.9
08	230	11.9			110	3.4		2.7
09	---	12.5	220	---	110	3.8	4.3	2.6
10	(240)	13.4	210	5.1	110	3.9	4.7	2.5
11	(250)	14.0	210	5.3	110	3.9	4.8	2.5
12	250	14.0	200	5.0	110	---		2.4
13	(240)	14.6	210	4.9	---	---		2.5
14	---	15.0	220	---	110	3.9		2.5
15	---	15.0	230	---	120	3.7		2.6
16	(240)	15.2	240	---	120	3.4		2.6
17	250	15.2			130	2.8		2.6
18	280	15.2			---	<2.4	<2.6	2.6
19	360	>15.0					<2.6	(2.5)
20	330	(14.6)					<2.2	---
21	280	(15.2)					<2.2	(2.6)
22	270	(15.0)					<2.5	(3.0)
23	260	17.0					<2.2	2.95

Time: 45.0°W.
Sweep: 1.75 Mc to 20.0 Mc in 2 minutes 30 seconds.

Table 61

Lulea, Sweden (65.6°N, 22.1°E) — September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	330	---					2.5	
01	350	---					2.5	
02	320	---					2.5	
03	300	---					2.4	
04	310	---			---	---	1.9	
05	275	---	---	---	---	1.7		
06	250	(6.0)	260	---	130	2.3		
07	(240)	(6.9)	260	---	120	2.5		
08	(240)	7.0	230	---	110	3.2		---
09	(240)	7.2	245	5.0	110	3.4		---
10	---	7.5	---	---	110	---		---
11	---	>8.3	230	5.0	110	---		---
12	---	>9.0	---	---	110	---		---
13	---	>8.8	---	---	110	---		---
14	---	>9.0	---	---	110	---		
15	(240)	>8.6	---	---	110	2.7		---
16	250	>8.0	---	---	110	2.5		
17	250	>8.5			130	2.3		
18	240	>7.9			---	1.8	2.4	
19	250	---			---	---		
20	250	---						
21	260	---						
22	270	---					2.5	
23	300	---					2.5	

Time: 15.0°E.
Sweep: 1.5 Mc to 10.0 Mc in 9 minutes, automatic operation.

Table 62

Sao Paulo, Brazil (23.5°S, 46.5°W) — September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	230	>14.0					<2.6	3.1
01	230	>14.0					<2.5	3.1
02	220	12.5					<2.6	3.2
03	220	9.2					<2.5	3.0
04	260	8.2					<2.5	2.7
05	260	6.6					<2.5	2.8
06	280	7.4			---	---	<2.5	2.9
07	250	9.9			---	2.6		3.1
08	250	11.6	---	---	125	3.2		2.9
09	---	13.2	240	---	120	3.5		2.8
10	---	13.8	230	---	120	3.6		2.8
11	(260)	14.0	230	---	120	---		2.7
12	(270)	14.2	220	5.3	120	---		2.6
13	(260)	14.2	220	4.9	120	---		2.6
14	(260)	14.4	220	(4.8)	120	3.7		2.6
15	---	14.4	240	---	130	3.6		2.6
16	(250)	14.4	250	---	130	3.3	3.9	2.6
17	260	14.6			---	2.7		2.7
18	280	(14.8)			---	---	<2.6	(2.8)
19	300	(14.4)					<2.6	(2.7)
20	280	(14.1)					<2.5	(2.75)
21	260	(14.6)					<2.5	(2.8)
22	250	15.0					<2.6	3.0
23	240	(14.8)					<2.5	(3.1)

Time: 45.0°W.
Sweep: 1.75 Mc to 20.0 Mc in 2 minutes 30 seconds.

Table 63*

Campbell I. (52.5°S, 169.2°E) — May 1955

Time	h'F2	foF2	h'F1	foF1	h'E	foE	foEs	(M3000)F2
00								
01								
02								
03								
04								
05	---	E						---
06	---	E						---
07	270	2.7	---	---	---	---		3.1
08	250	4.3	230	2.0	---	---		3.3
09	250	4.8	230	3.2	130	2.3		3.3
10	260	5.0	240	3.6	125	2.7		3.3
11	280	5.4	240	3.8	130	2.8		3.2
12	260	5.5	240	3.8	130	2.8		3.2
13	270	5.3	230	3.7	120	2.6		3.35
14	270	5.3	240	3.5	---	---		3.2
15	260	5.5	240	---	---	---		3.2
16	250	5.2	240	---	---	---		3.1
17	260	4.7	240	---				3.1
18	260	4.0						3.1
19	280	3.5						3.0
20	290	2.7						3.0
21	340	2.1						2.9
22	390	2.0						2.9
23	---	E						(2.9)

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour working schedule.

Table 64*

Campbell I. (52.5°S, 169.2°E) — April 1955

Time	h'F2	foF2	h'F1	foF1	h'E	foE	foEs	(M3000)F2
00								
01								
02								
03								
04								
05	---	(2.0)						---
06	280	2.2						3.2
07	260	3.8	---	---	---	---		3.2
08	260	4.4	240	---	130	2.2		3.2
09	300	4.8	240	3.8	130	2.6		3.2
10	300	5.1	230	3.9	130	2.7		3.2
11	300	5.5	230	4.0	130	2.8		3.2
12	300	5.5	240	4.0	130	2.8		3.2
13	290	5.6	230	4.0	130	2.8		3.2
14	270	5.7	240	3.8	120	2.6		3.2
15	280	5.4	240	3.4	120	2.5		3.2
16	270	5.3	240	---	---	---		3.2
17	260	5.2	240	---				3.1
18	260	5.1	240	---				3.0
19	260	4.3	---	---				3.0
20	270	3.7						3.0
21	300	3.1						3.0
22	330	2.4						2.9
23	340	(2.2)					2.0	(3.0)

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour schedule.

Table 65*

Campbell I. (52.5°S, 169.2°E) — March 1955

Time	h'F2	foF2	h'F1	foF1	h'E	foE	foEs	(M3000)F2
00								
01								
02								
03								
04								
05	280	2.8			---			3.0
06	280	3.5	250	---	---			3.1
07	(350)	4.1	250	3.8	130			3.0
08	300	4.6	240	4.0	130			3.1
09	340	4.8	230	4.0	130			3.1
10	330	5.2	230	4.2	120			3.2
11	320	5.3	230	4.2	120			3.2
12	330	5.4	230	4.3	120			3.1
13	320	5.4	240	4.2	125			3.1
14	320	5.3	240	4.2	130			3.1
15	320	5.3	240	3.9	125			3.1
16	300	5.3	240	3.9	130			3.2
17	300	5.2	250	3.8	130			3.1
18	280	5.3	250	---				3.1
19	270	5.0	250	---				3.0
20	270	4.4						3.0
21	280	3.6						3.0
22	320	2.9						2.9
23	(300)	2.6					2.0	2.9

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour schedule.

Table 66*

Campbell I. (52.5°S, 169.2°E) — February 1955

Time	h'F2	foF2	h'F1	foF1	h'E	foE	foEs	(M3000)F2
00								
01								
02								
03								
04								
05	270	3.4	---	---	120	2.6		3.1
06	(300)	4.1	250	3.6	120	2.6		3.1
07	310	4.5	240	3.9	120	2.8		3.1
08	350	5.0	230	4.2	120	2.8		3.0
09	350	5.3	230	4.3	120	3.0		3.0
10	330	5.4	220	4.4	120	3.0	3.3	3.1
11	350	5.5	220	4.5	120	3.1	3.6	3.0
12	350	5.6	220	4.4	120	3.1	3.3	3.05
13	330	5.6	230	4.4	120	3.1	3.2	3.1
14	330	5.6	230	4.4	120	3.1		3.1
15	340	5.5	230	4.3	120	3.1		3.0
16	340	5.4	240	4.1	120	2.8		3.1
17	310	5.4	250	3.8	120	2.8		3.1
18	300	5.3	250	3.5	---	---		3.05
19	270	5.5	260	---	---	---		3.0
20	270	5.5						3.0
21	270	4.8						2.9
22	290	4.1						2.85
23	300	3.8						2.9

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour working schedule.

Table 67*

Campbell I. (52.5°S, 169.2°E) January 1955

Time	h'F2	foF2	h'F1	foF1	h'E	foE	foEs	(M3000)F2
00								
01								
02								
03								
04								
05	(250)	4.0	220	---	140	2.3		3.1
06	300	4.4	240	3.9	130	2.5		3.0
07	340	4.8	240	4.0	125	2.6		3.0
00	380	5.1	240	4.2	125	2.8		3.0
09	350	5.2	230	4.4	120	3.0		3.0
10	350	5.5	230	4.4	120	2.8	2.8	3.0
11	370	5.3	230	4.5	120	2.9	3.6	3.0
12	350	5.4	220	4.4	120	3.1	3.5	3.0
13	350	5.6	220	4.4	120	3.0	3.4	3.0
14	350	5.4	230	4.4	120	3.1		3.0
15	350	5.4	230	4.3	120	2.0	3.0	3.0
16	340	5.5	240	4.1	125	2.8		3.0
17	320	5.6	240	4.0	130	2.6		3.0
18	300	5.5	240	3.6	130	2.3		3.0
19	270	5.2	240	---	---	---		3.0
20	260	5.4						3.0
21	260	5.1						3.0
22	260	4.8						3.0
23	280	4.0					2.2	3.0

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour working schedule.

Table 68*

Campbell I. (52.5°S, 169.2°E) May 1954

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05	---	E						
06	---	E						
07	---	2.4			---	---		3.0
08	240	3.6	220	2.4	---	1.8	1.8	3.4
09	240	4.2	220	3.2	120	2.2		3.4
10	250	4.5	220	3.5	115	2.4		3.4
11	260	4.6	230	3.6	110	2.6		3.4
12	260	4.8	230	3.7	110	2.6		3.4
13	260	4.8	220	3.6	110	2.5		3.3
14	260	4.8	230	3.4	120	2.4		3.3
15	250	4.7	240	2.9	130	2.0		3.3
16	240	4.6			---	1.6		3.3
17	240	4.2						3.1
18	---	3.2						3.1
19	---	2.4						3.0
20	---	E						2.8
21	---	E						---
22	---	E						---
23	---	E						

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour working schedule.

Table 69*

Campbell I. (52.5°S, 169.2°E) April 1954

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05	---	E						---
06	---	2.2			---	---		2.95
07	240	3.2	---	---	---	1.8		3.3
08	(250)	4.1	230	3.1	110	2.2		3.3
09	290	4.5	230	3.7	110	2.6		3.2
10	300	4.7	230	3.8	110	2.6		3.3
11	300	4.9	220	3.9	110	2.8		3.2
12	300	5.1	220	3.9	110	2.8		3.2
13	290	5.1	230	3.9	110	2.6		3.3
14	280	5.0	230	3.7	110	2.6		3.3
15	280	5.0	230	3.6	110	2.4		3.2
16	250	5.0	240	2.6	---	2.0		3.2
17	240	5.0	---	---	---	1.7		3.2
18	240	4.5						3.1
19	260	3.8						3.0
20	---	2.9						2.8
21	---	2.5						2.9
22	---	2.0						2.8
23	---	E					3.0	---

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour working schedule.

Table 70*

Campbell I. (52.5°S, 169.2°E) January 1954

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05	250	3.7	230	---	120	2.2		3.2
06	300	4.3	230	3.4	110	2.4	3.2	3.2
07	330	4.6	230	3.8	110	2.7		3.1
08	350	4.7	220	4.0	110	2.9		3.05
09	340	5.0	220	4.1	110	3.1		3.1
10	340	5.1	210	4.2	110	3.2		3.05
11	350	5.1	210	4.2	110	3.3		3.05
12	350	5.2	210	4.2	110	3.3		3.0
13	350	5.2	220	4.2	110	3.2		3.0
14	350	5.1	220	4.2	110	3.2		3.0
15	360	5.1	230	4.1	110	3.1		3.0
16	330	5.2	230	4.0	110	2.9		3.0
17	310	5.3	230	3.8	110	2.6		3.1
18	280	5.3	240	3.4	120	2.3		3.1
19	270	5.2	250	2.9	140	1.9		3.1
20	250	5.3	---	---	---	1.5		3.0
21	250	4.9						3.0
22	260	4.5						3.0
23	---	3.8						3.0

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour working schedule.

Table 71*

Campbell I. (52.5°S, 169.2°E) December 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05	250	4.0	240	3.2	110	2.2		3.2
06	300	4.4	230	3.6	110	2.5		3.1
07	350	4.8	230	3.9	110	2.8		3.0
08	340	5.0	220	4.0	110	3.0		3.1
09	340	5.3	220	4.1	110	3.1		3.1
10	340	5.4	220	4.2	110	3.2		3.1
11	340	5.5	220	4.2	110	3.2		3.1
12	330	5.5	210	4.2	110	3.2		3.1
13	320	5.5	210	4.2	110	3.2		3.1
14	330	5.4	220	4.2	110	3.2		3.1
15	330	5.4	220	4.1	110	3.0		3.1
16	320	5.4	220	3.9	110	2.9		3.05
17	310	5.5	240	3.7	110	2.6		3.1
18	280	5.6	240	3.4	120	2.3		3.1
19	260	5.5	240	2.9	---	1.0		3.1
20	250	5.6			---	1.6		3.1
21	240	5.5					2.0	3.1
22	250	5.0						3.0
23	260	4.5						3.0

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour working schedule.

Table 72*

Campbell I. (52.5°S, 169.2°E) October 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05	250	3.2	---	---	130	1.5		3.1
06	250	3.7	240	---	120	2.1		3.2
07	370	4.2	240	3.6	110	2.4		3.0
08	380	4.4	220	3.8	110	2.6		2.9
09	390	4.6	230	3.9	110	2.8		2.9
10	370	4.8	220	4.0	110	2.9		2.9
11	340	5.1	210	4.1	110	3.0		3.0
12	340	5.2	210	4.1	110	3.0		3.0
13	330	5.2	210	4.0	110	2.9		3.05
14	320	5.2	220	4.0	110	2.8		3.1
15	310	5.3	220	3.8	110	2.7		3.1
16	290	5.2	230	3.5	110	2.4		3.1
17	280	5.0	240	3.2	120	2.1		3.1
18	260	4.8	260	2.6	140	1.6		3.0
19	250	4.8			---	1.3		3.0
20	250	4.3						3.0
21	260	3.5						2.9
22	280	2.8						2.8
23	---	2.5						2.7

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.
*Observations taken on a 19-hour working schedule.

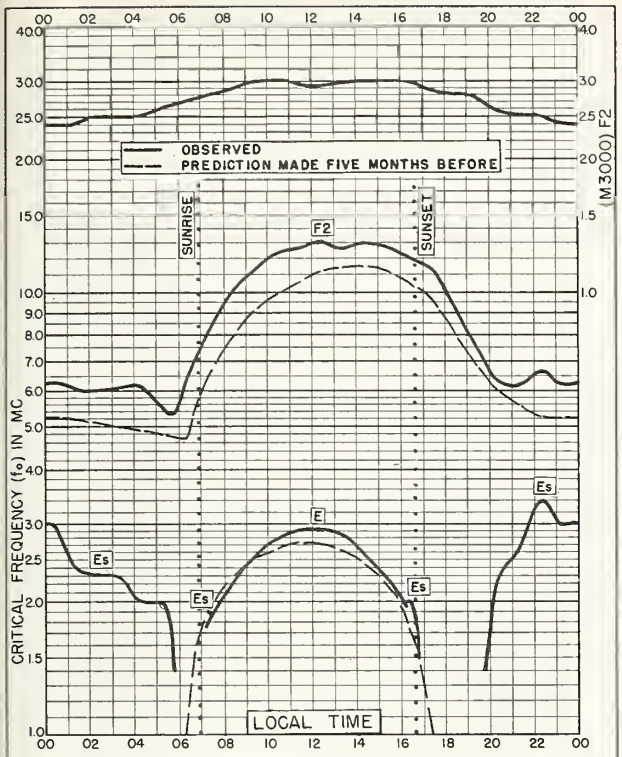


Fig. 1. LYCKSELE, SWEDEN
64.6°N, 18.8°E OCTOBER 1957

NBS 503

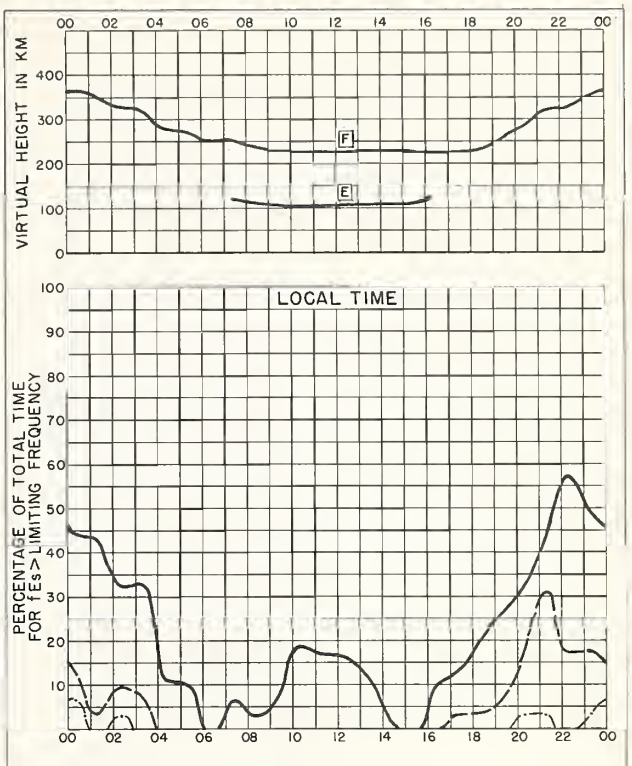


Fig. 2. LYCKSELE, SWEDEN OCTOBER 1957

NBS 490

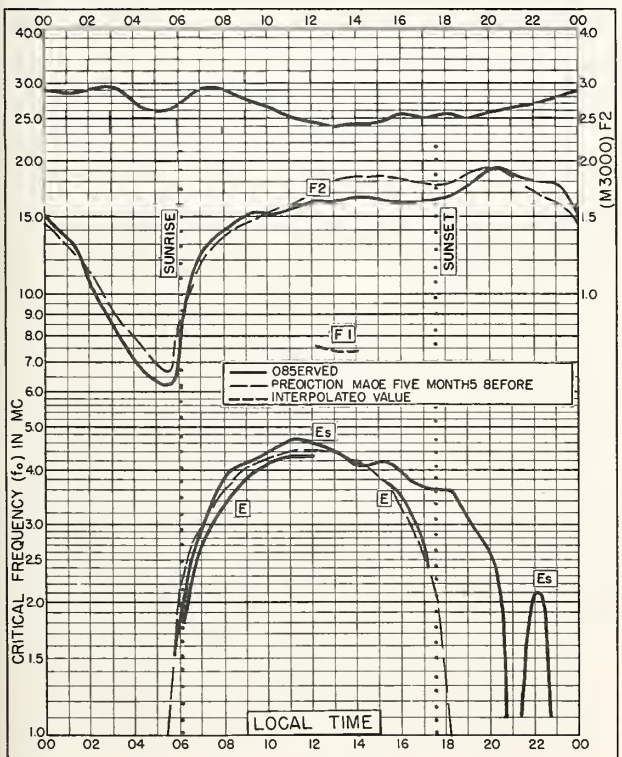


Fig. 3. FORMOSA, CHINA
25.0°N, 121.5°E OCTOBER 1957

NBS 503

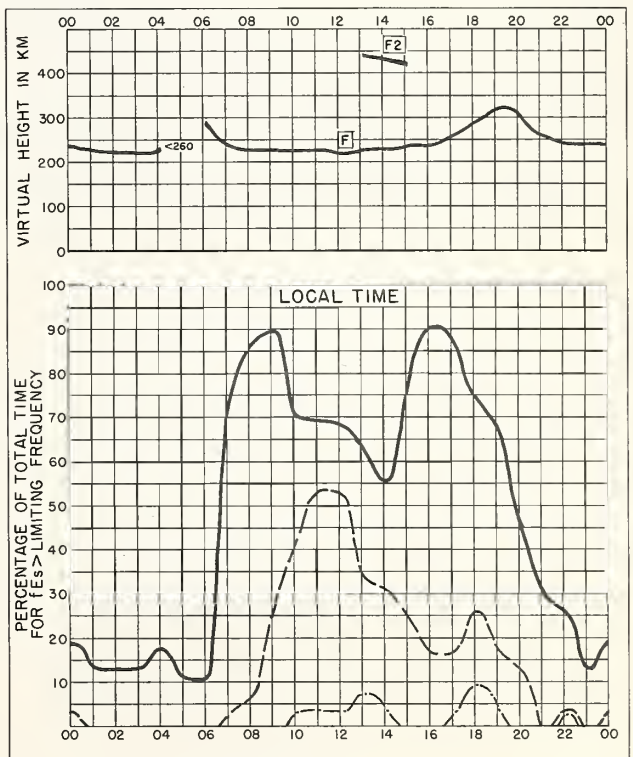


Fig. 4. FORMOSA, CHINA OCTOBER 1957

NBS 490

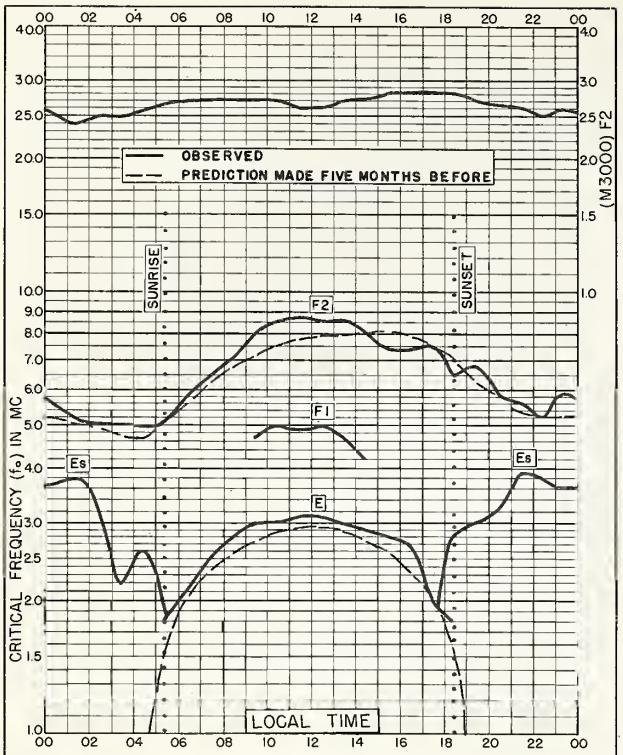


Fig. 5. KIRUNA, SWEDEN
67.8°N, 20.3°E SEPTEMBER 1957

NBS 503

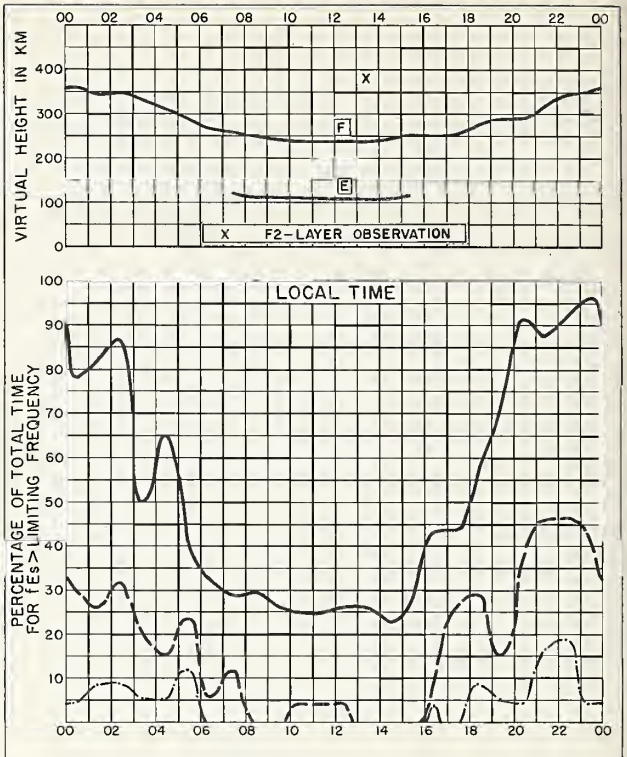


Fig. 6. KIRUNA, SWEDEN SEPTEMBER 1957

Commerce-Standards-Boulder, Colo. NBS 490

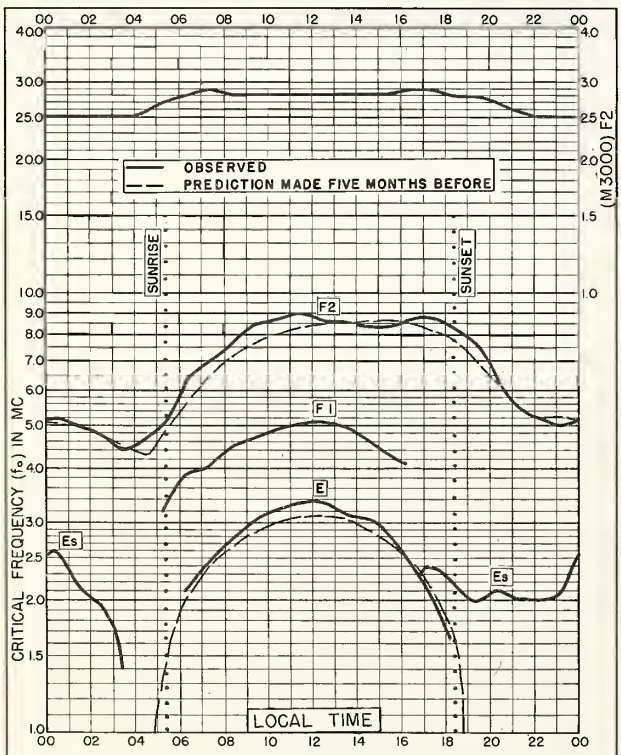


Fig. 7. LYCKSELE, SWEDEN
64.6°N, 18.8°E SEPTEMBER 1957

NBS 503

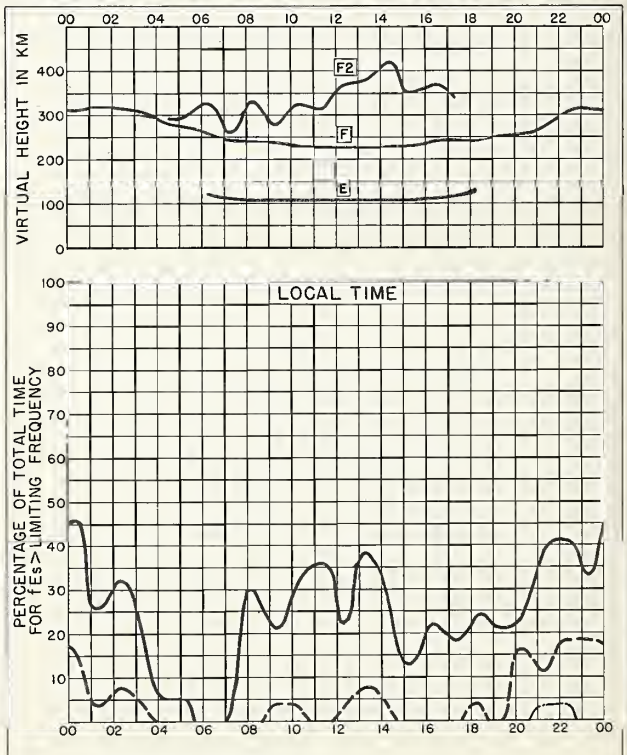


Fig. 8. LYCKSELE, SWEDEN SEPTEMBER 1957

Commerce-Standards-Boulder, Colo. NBS 490

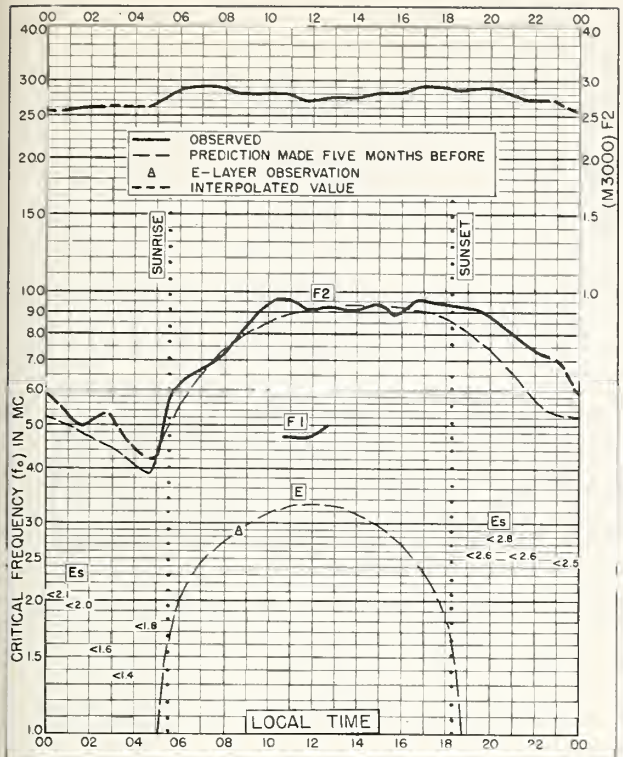


Fig. 9. NURMIJARVI, FINLAND
60.5°N, 24.6°E SEPTEMBER 1957

NBS 503

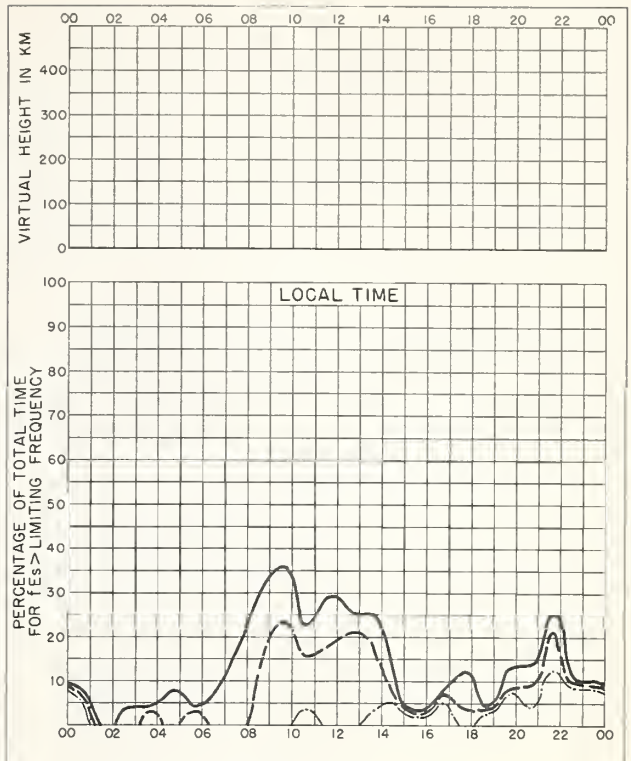


Fig. 10. NURMIJARVI, FINLAND SEPTEMBER 1957

NBS 490

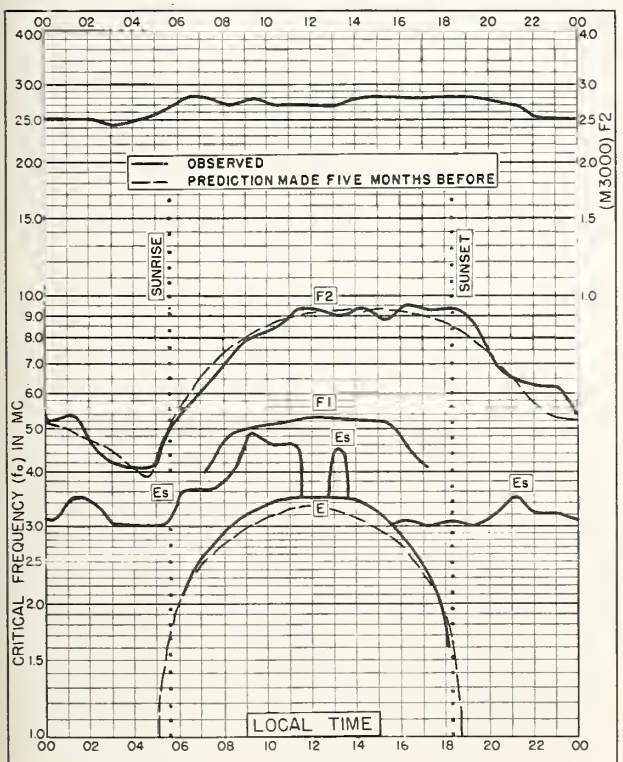


Fig. 11. UPSALA, SWEDEN
59.8°N, 17.6°E SEPTEMBER 1957

NBS 503

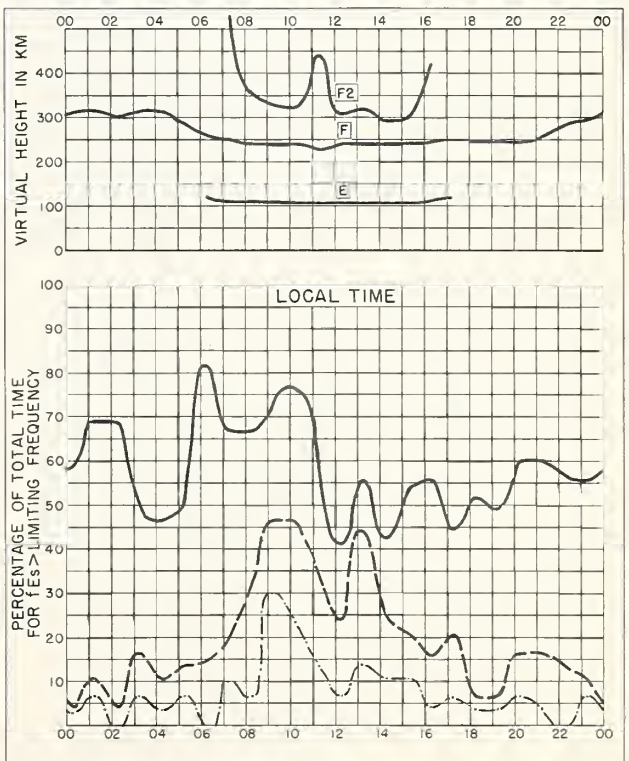


Fig. 12. UPSALA, SWEDEN SEPTEMBER 1957

NBS 490

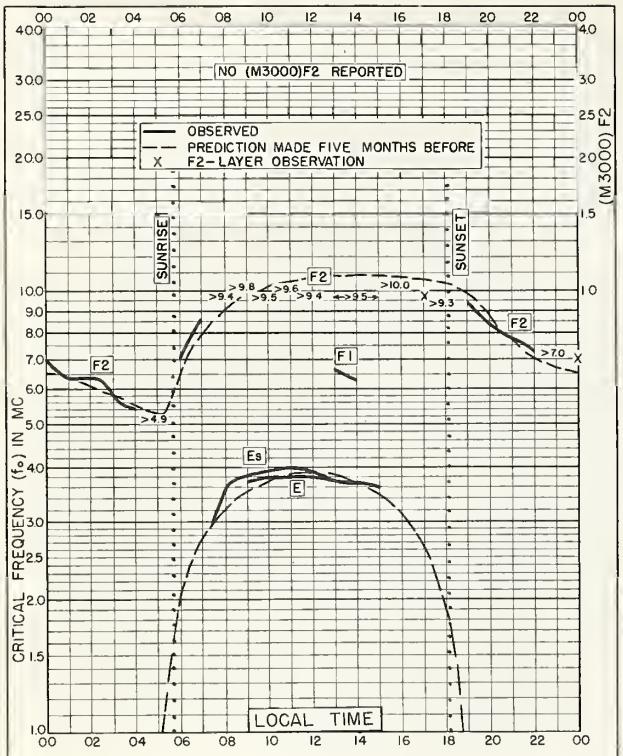


Fig. 13. GRAZ, AUSTRIA
47.1°N, 15.5°E SEPTEMBER 1957

NBS 503

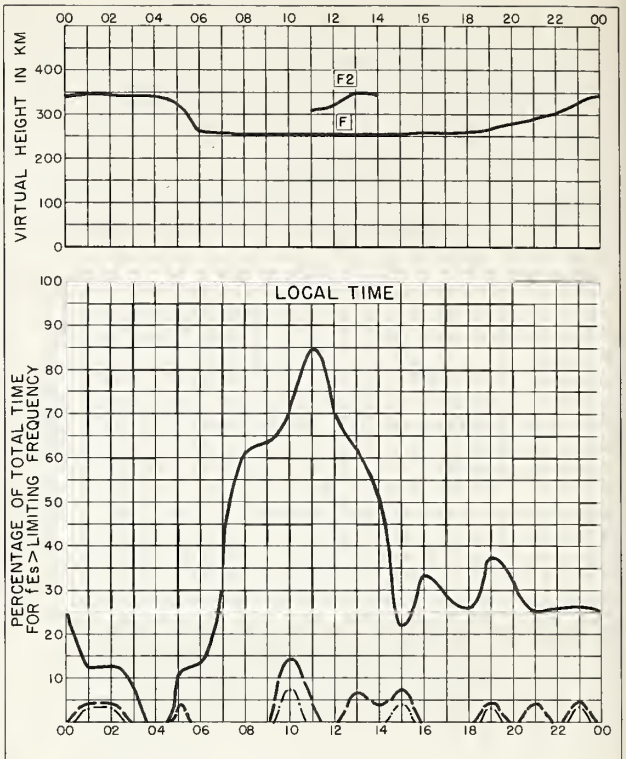


Fig. 14. GRAZ, AUSTRIA SEPTEMBER 1957

NBS 490

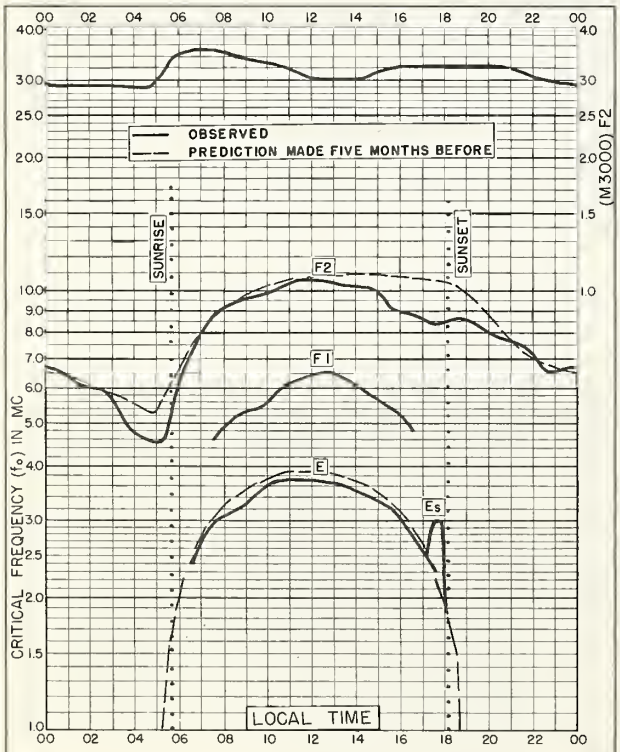


Fig. 15. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E SEPTEMBER 1957

NBS 503

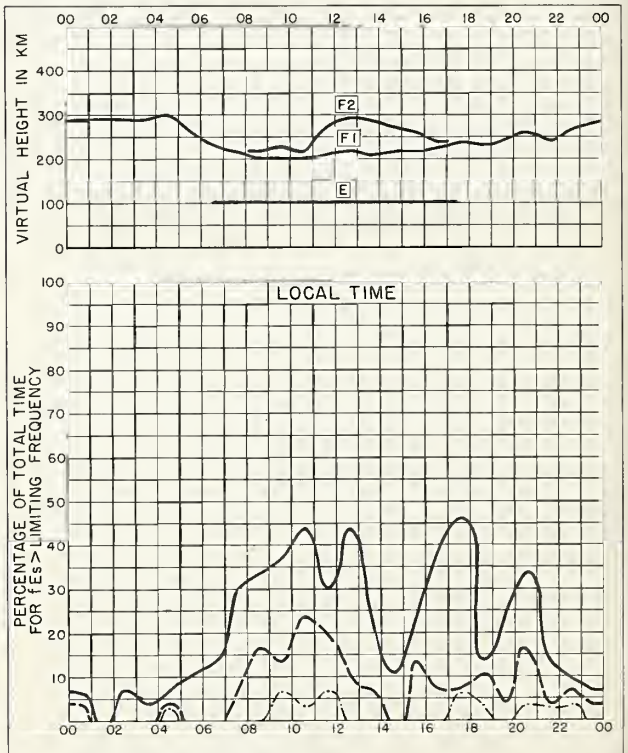


Fig. 16. SCHWARZENBURG, SWITZERLAND SEPTEMBER 1957

NBS 490

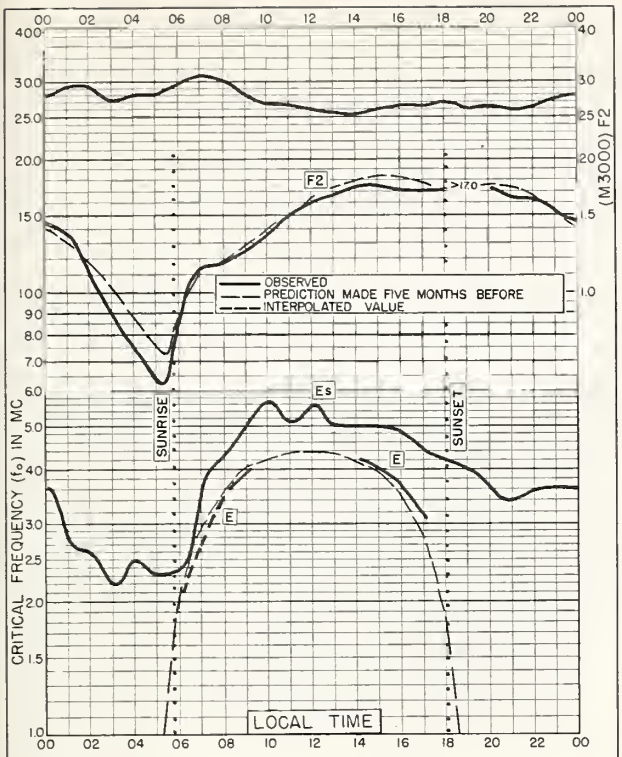


Fig. 17. FORMOSA, CHINA
25.0°N, 121.5°E SEPTEMBER 1957

NBS 503

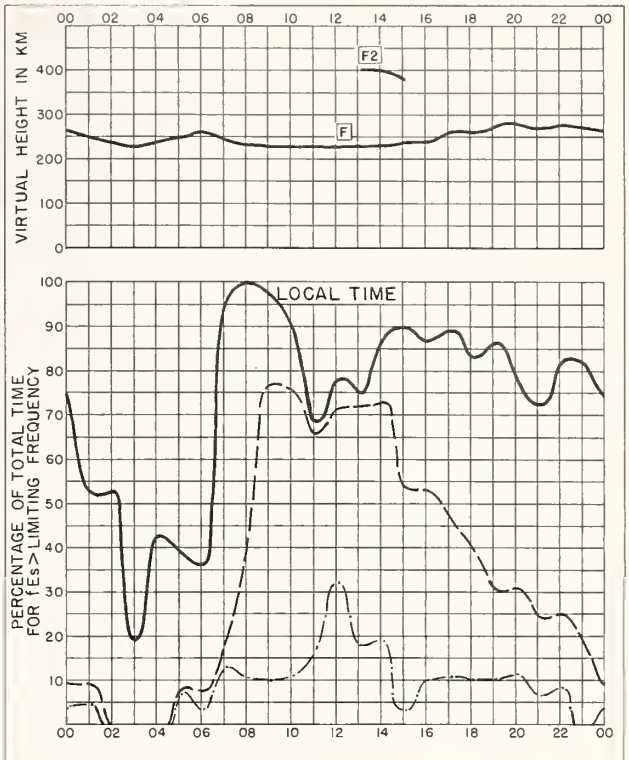


Fig. 18. FORMOSA, CHINA SEPTEMBER 1957

NBS 490

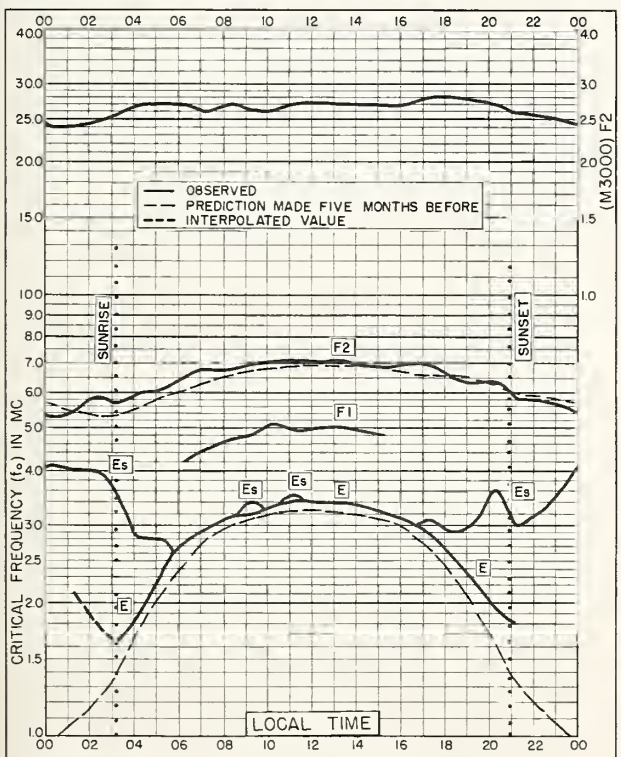


Fig. 19. TROMSO, NORWAY
69.7°N, 19.0°E AUGUST 1957

NBS 503

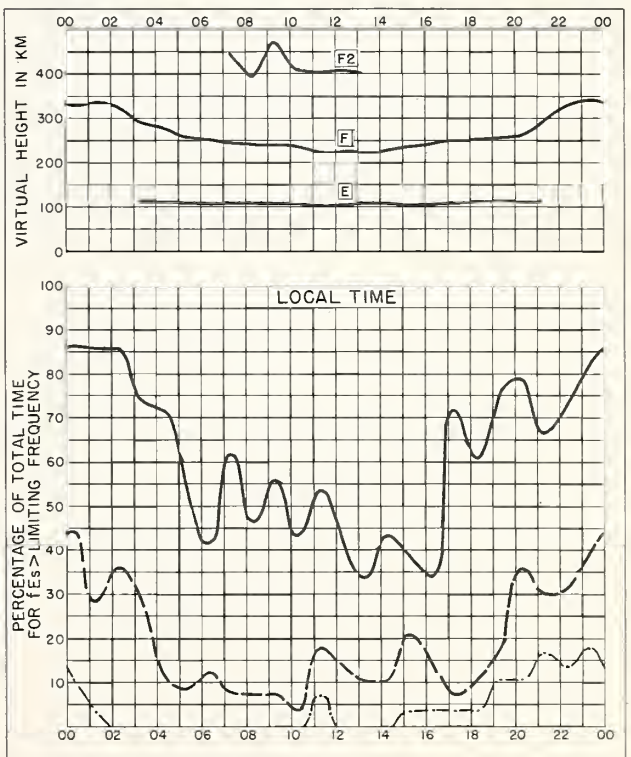


Fig. 20. TROMSO, NORWAY AUGUST 1957

NBS 490

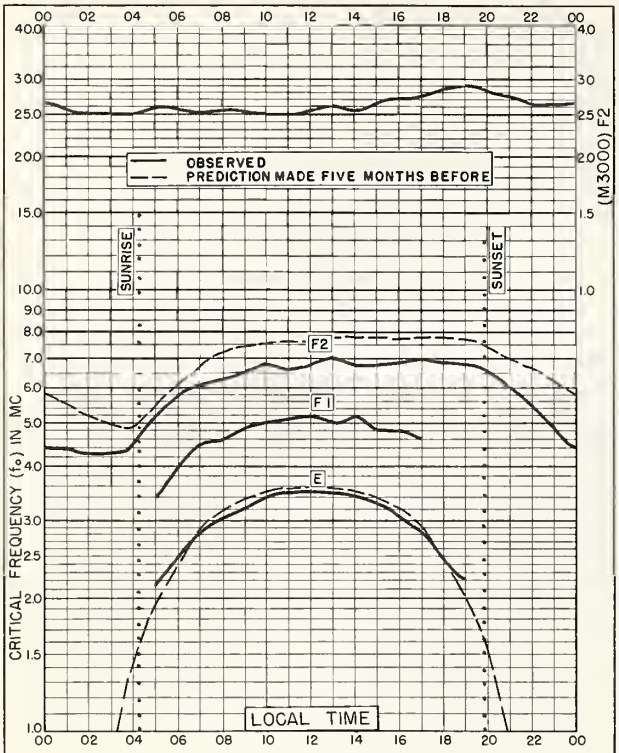


Fig. 21. ANCHORAGE, ALASKA
61.2°N, 149.9°W AUGUST 1957

NBS 503

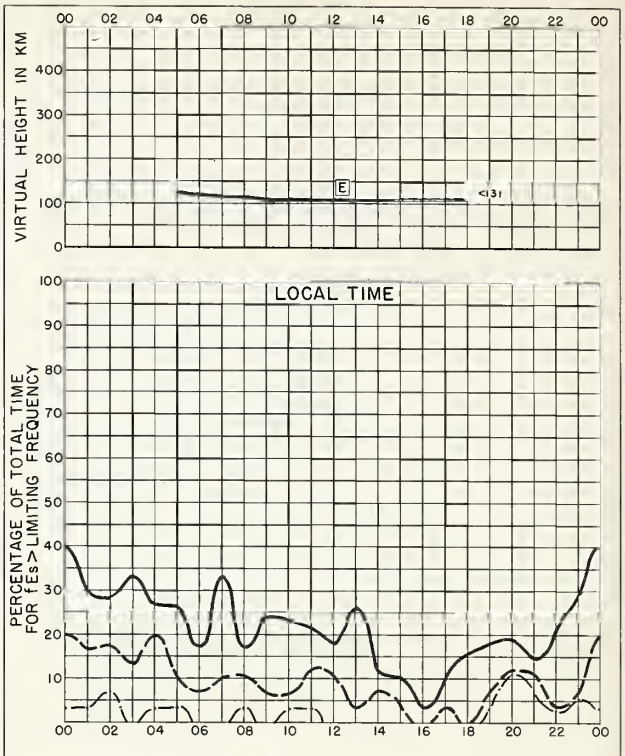


Fig. 22. ANCHORAGE, ALASKA AUGUST 1957

NBS 490

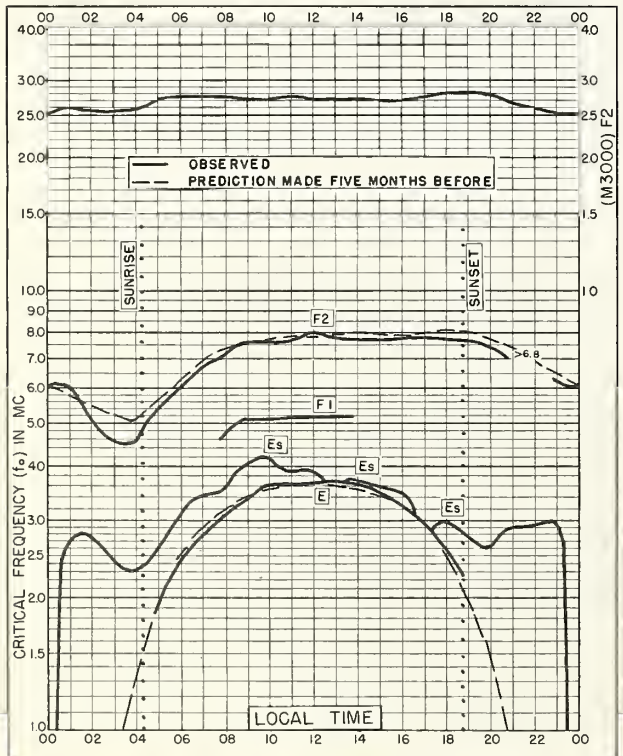


Fig. 23. OSLO, NORWAY
60.0°N, 11.1°E AUGUST 1957

NBS 503

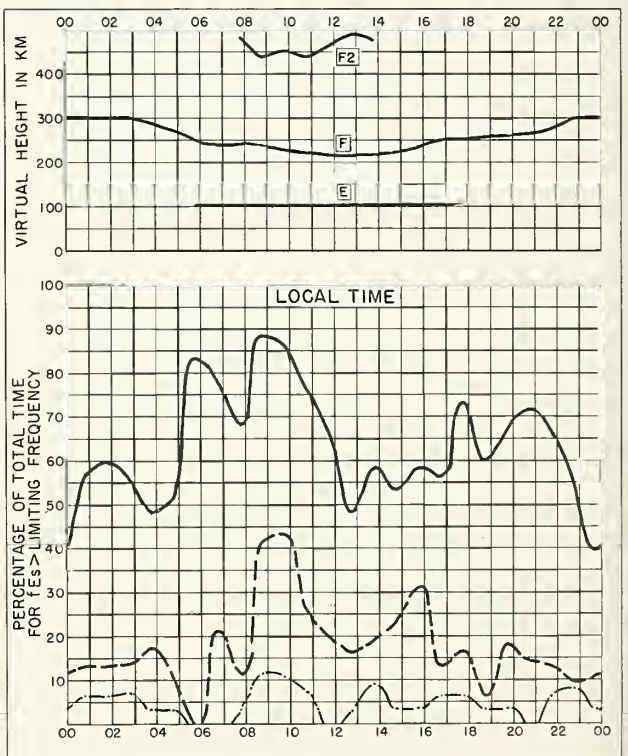


Fig. 24. OSLO, NORWAY AUGUST 1957

NBS 490

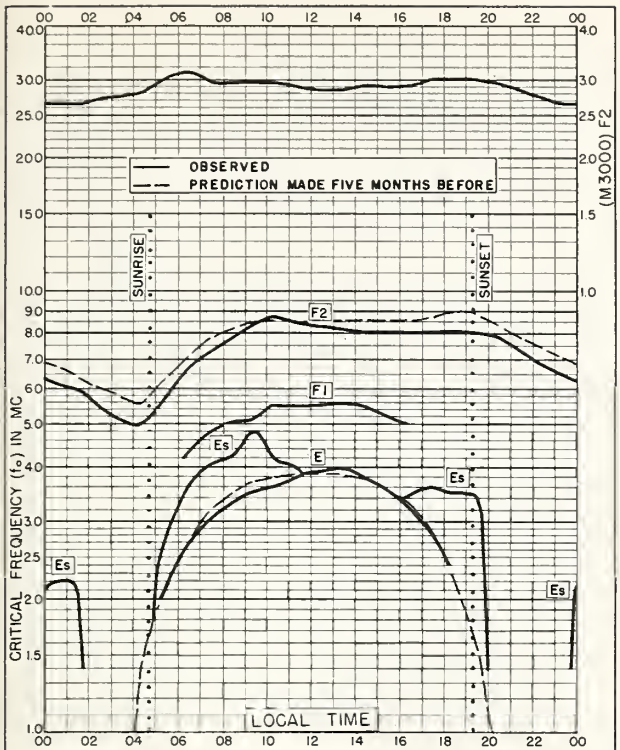


Fig. 25. De BILT, HOLLAND
52.1°N, 5.2°E AUGUST 1957

NBS 503

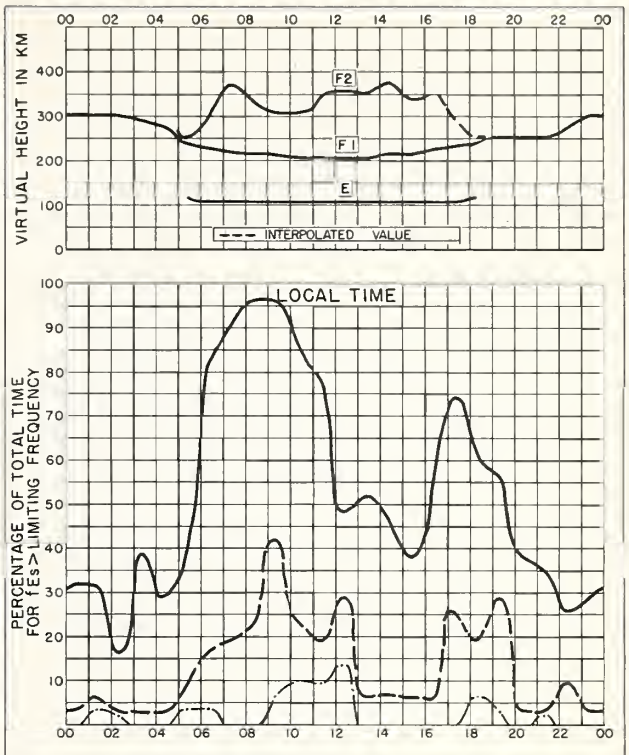


Fig. 26. De BILT, HOLLAND AUGUST 1957

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NBS 490

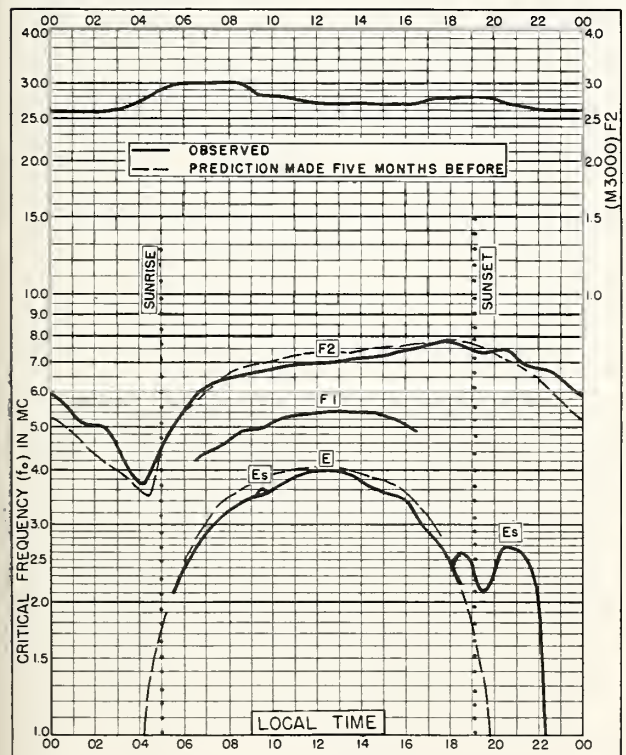
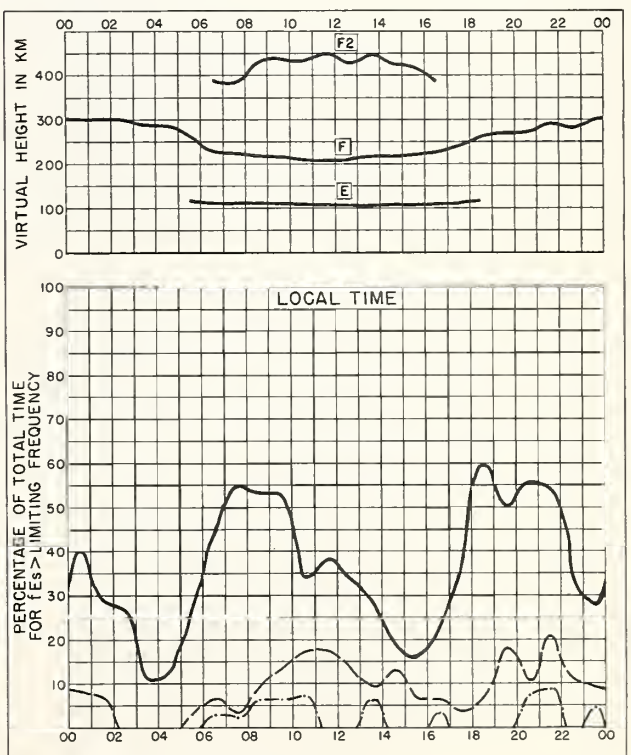


Fig. 27. ST. JOHN'S, NEWFOUNDLAND
47.6°N, 52.7°W AUGUST 1957

NBS 503



AUGUST 1957

Fig. 28. ST. JOHN'S, NEWFOUNDLAND

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NBS 490

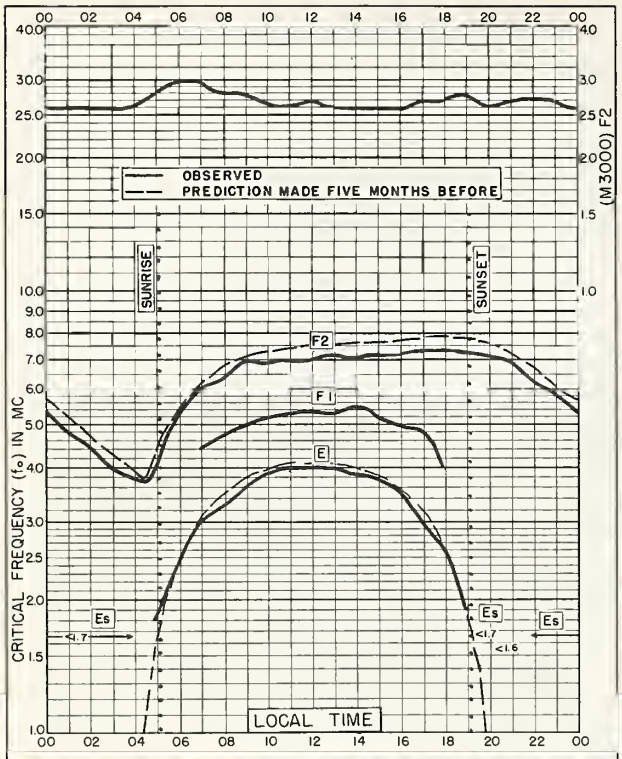

Fig. 29. OTTAWA, CANADA
45.4°N, 75.9°W AUGUST 1957

NBS 503

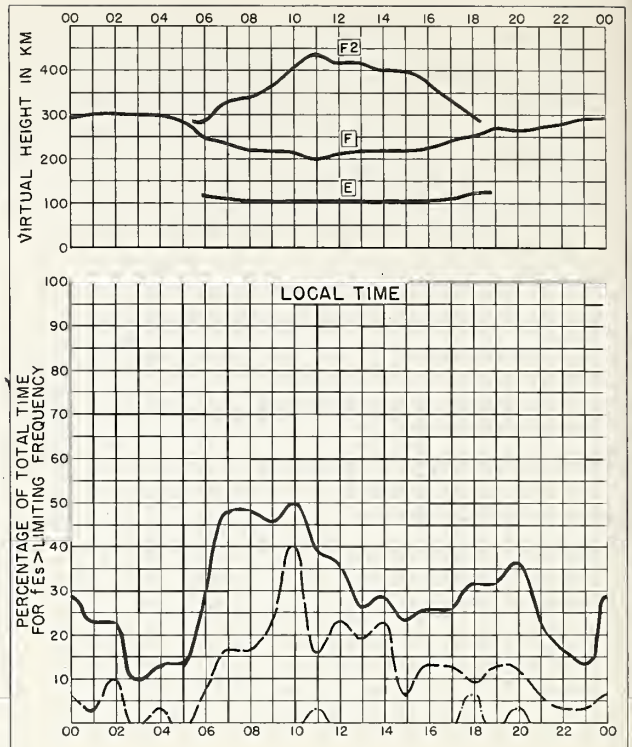

Fig. 30. OTTAWA, CANADA AUGUST 1957

NBS 490

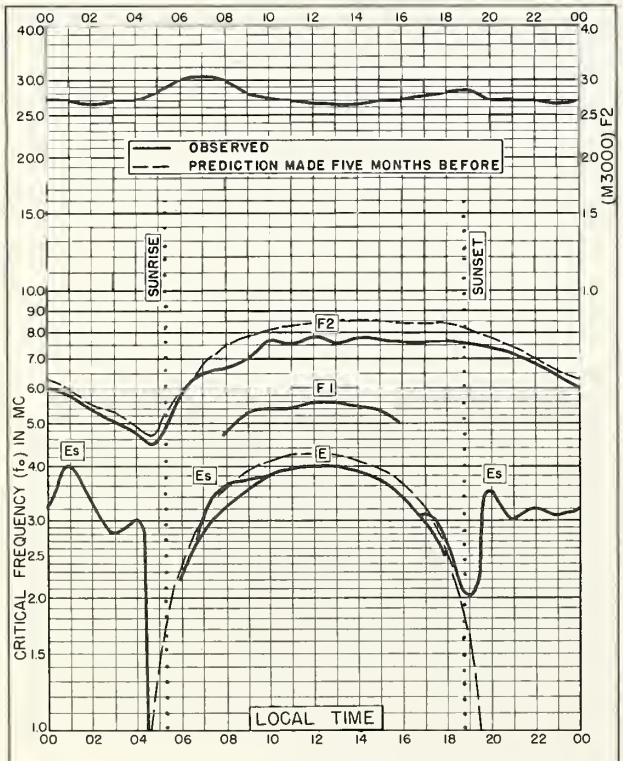

Fig. 31. WASHINGTON, D.C.
38.7°N, 77.1°W AUGUST 1957

NBS 503

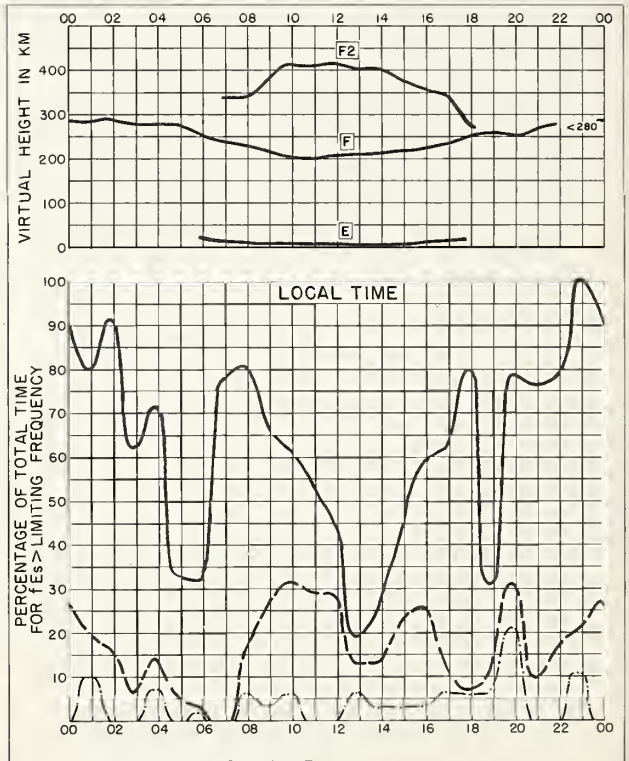

Fig 32. WASHINGTON, D.C. AUGUST 1957

NBS 490

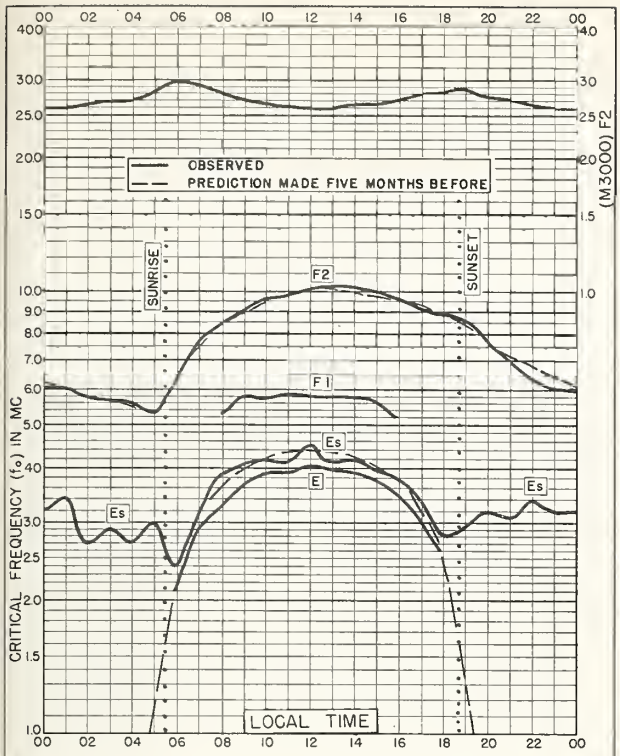

Fig. 33. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W AUGUST 1957

NBS 503

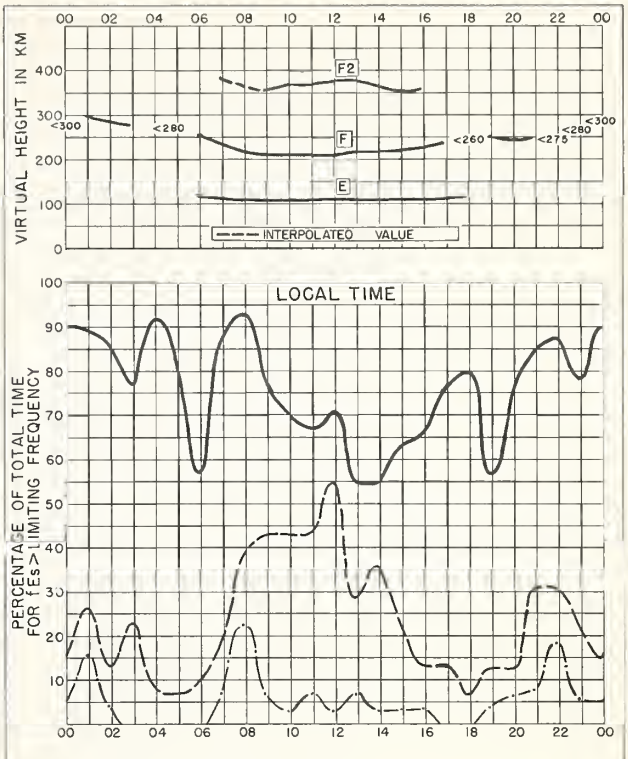

Fig. 34. WHITE SANDS, NEW MEXICO AUGUST 1957

NBS 490

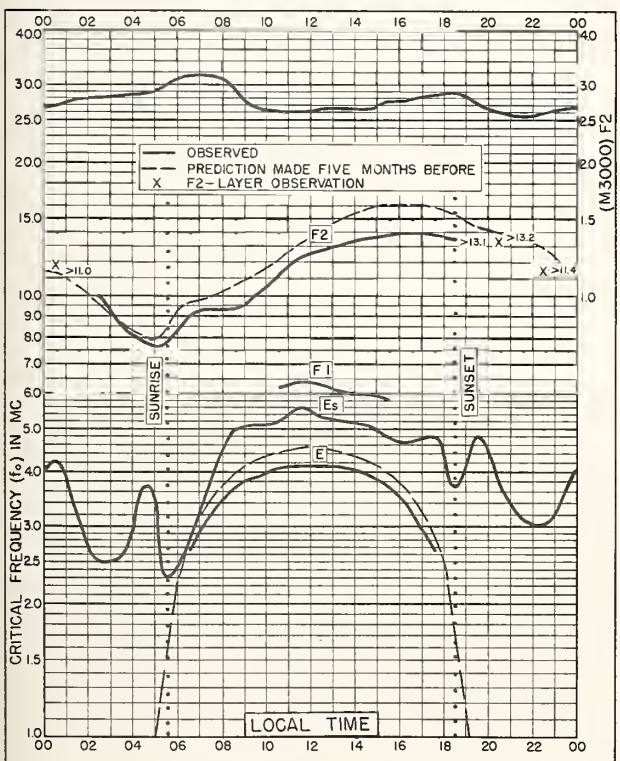

Fig. 35. OKINAWA I.
26.3°N, 127.8°E AUGUST 1957

NBS 503

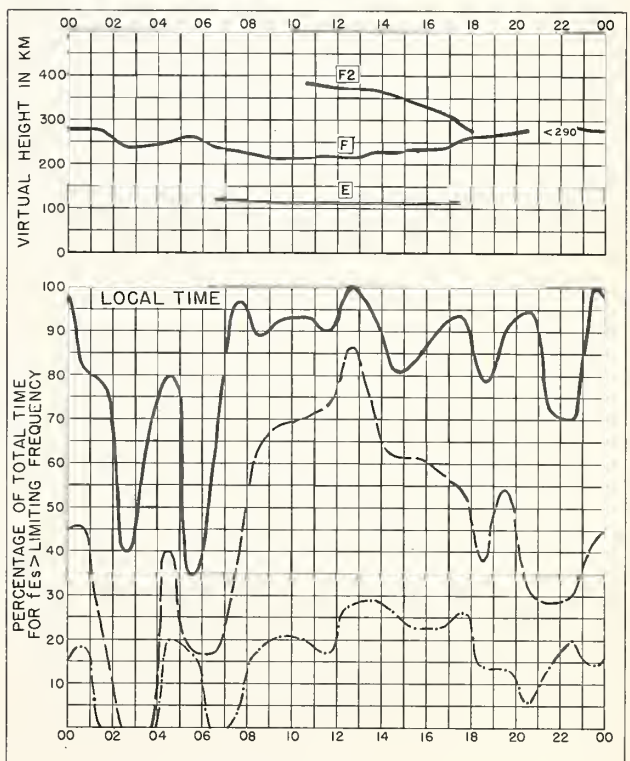

Fig. 36. OKINAWA I. AUGUST 1957

NBS 490

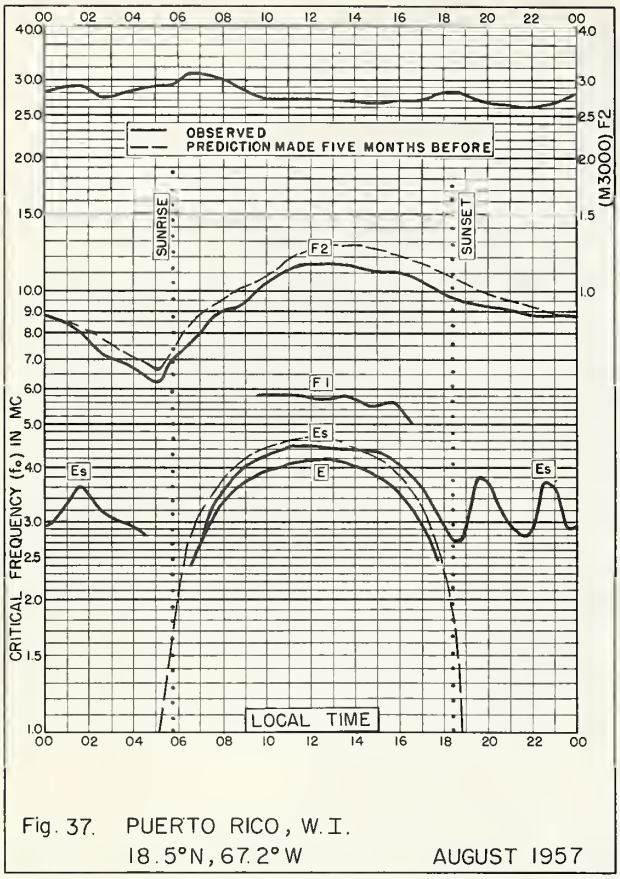

Fig. 37. PUERTO RICO, W.I.
18.5°N, 67.2°W AUGUST 1957

NBS 503

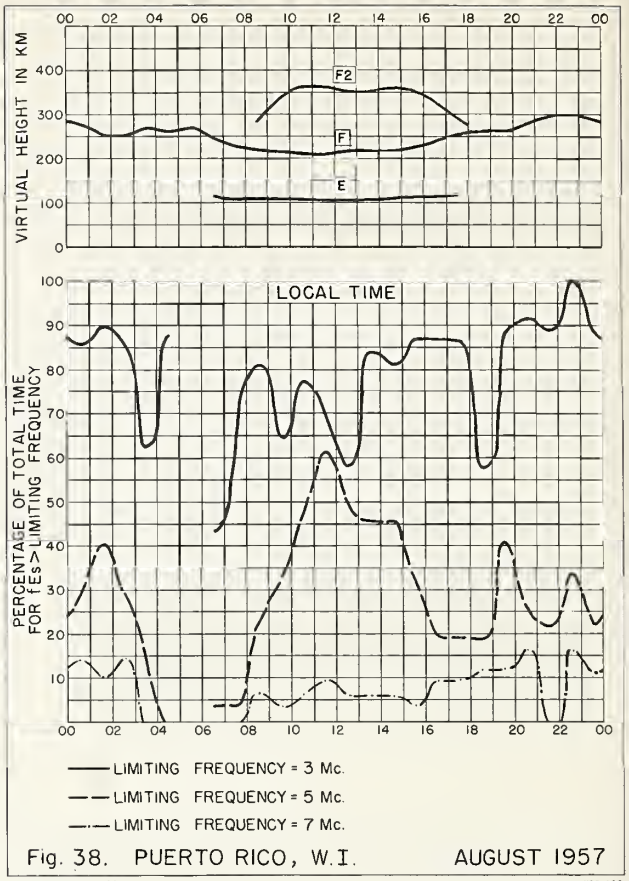

Fig. 38. PUERTO RICO, W.I. AUGUST 1957

NBS 490

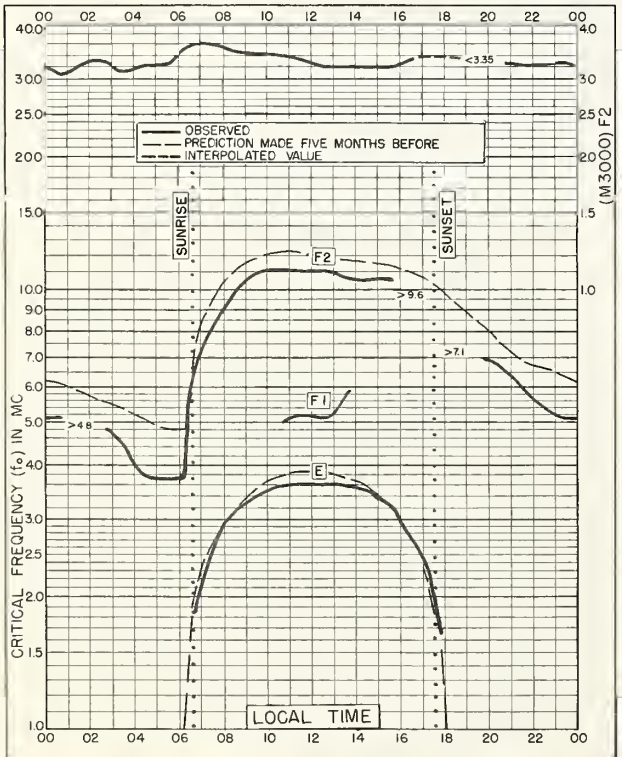

Fig. 39. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E AUGUST 1957

NBS 503

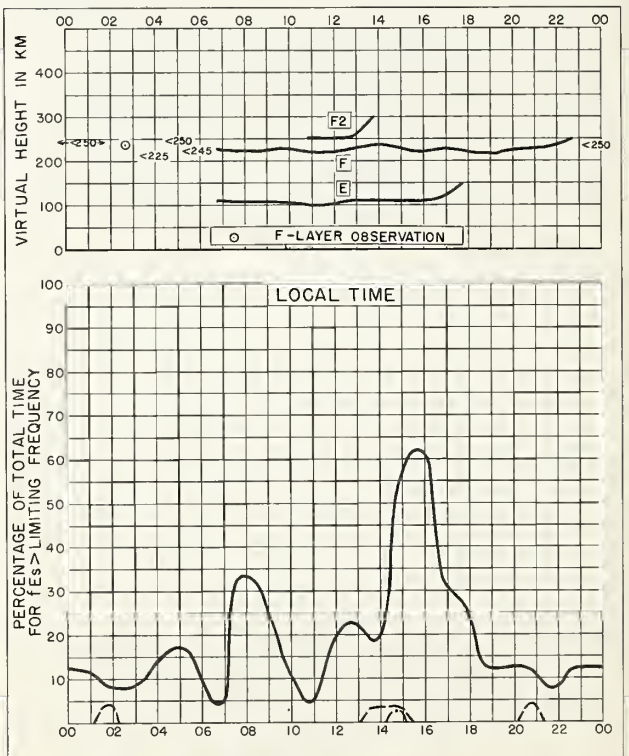

Fig. 40. WATHEROO, W. AUSTRALIA AUGUST 1957

NBS 490

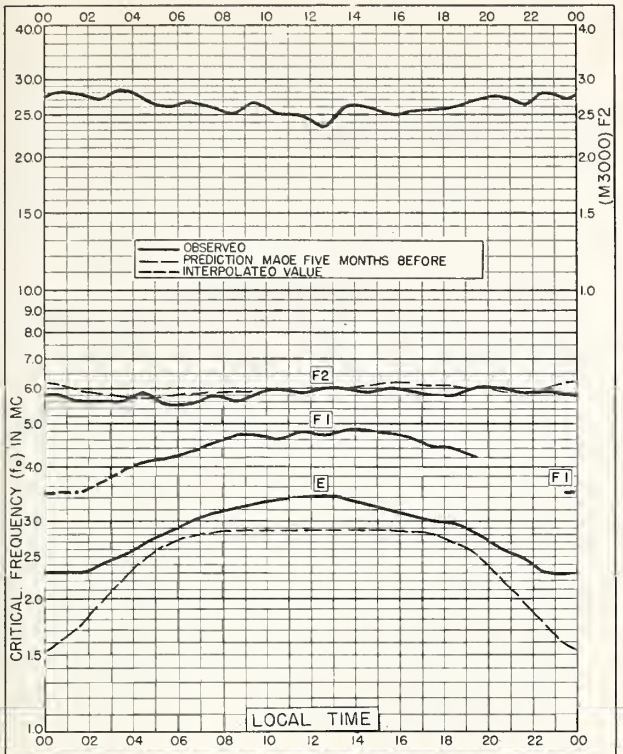

Fig. 41. THULE, GREENLAND
76.6°N, 68.7°W JULY 1957

NBS 503

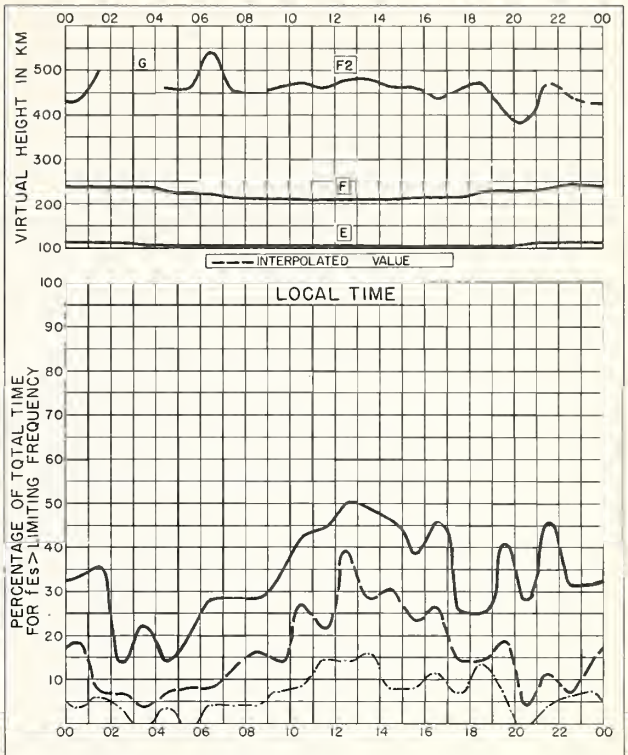

Fig. 42. THULE, GREENLAND JULY 1957

NBS 490

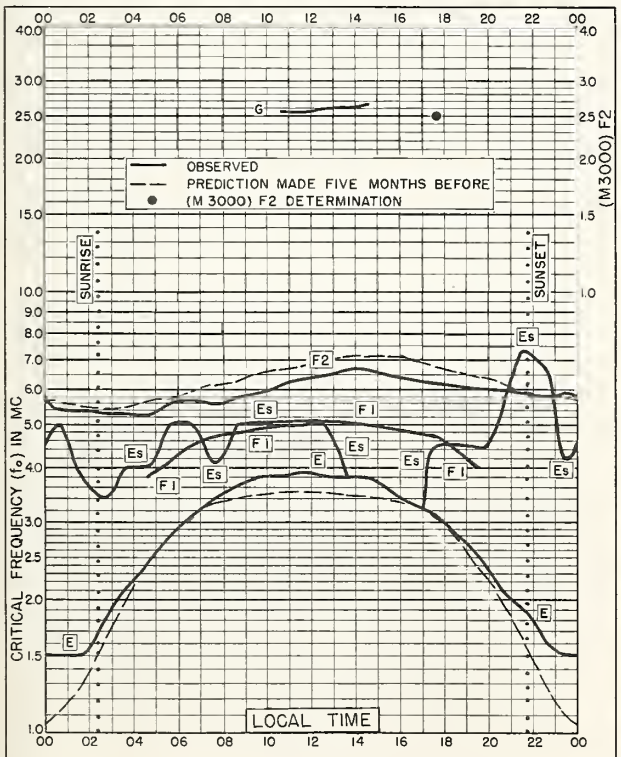

Fig. 43. BAKER LAKE, CANADA
64.3°N, 96.0°W JULY 1957

NBS 503

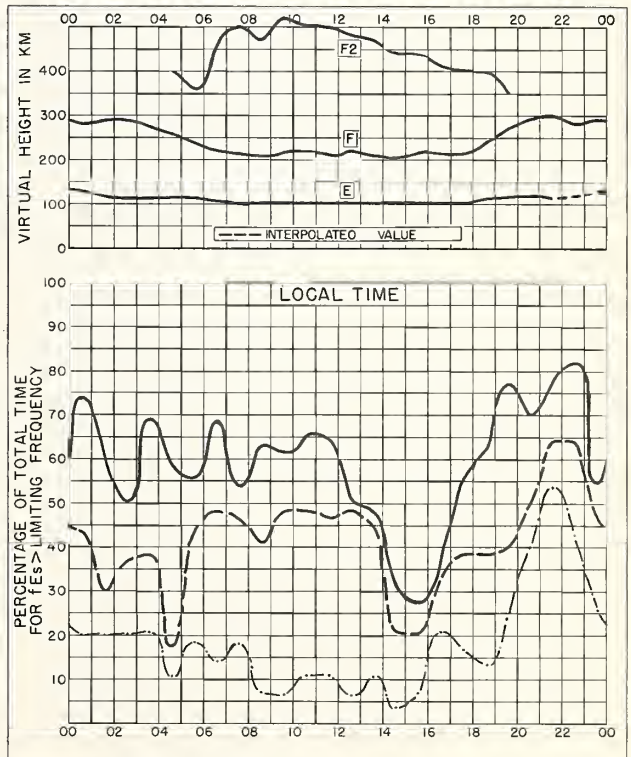

Fig. 44. BAKER LAKE, CANADA JULY 1957

NBS 490

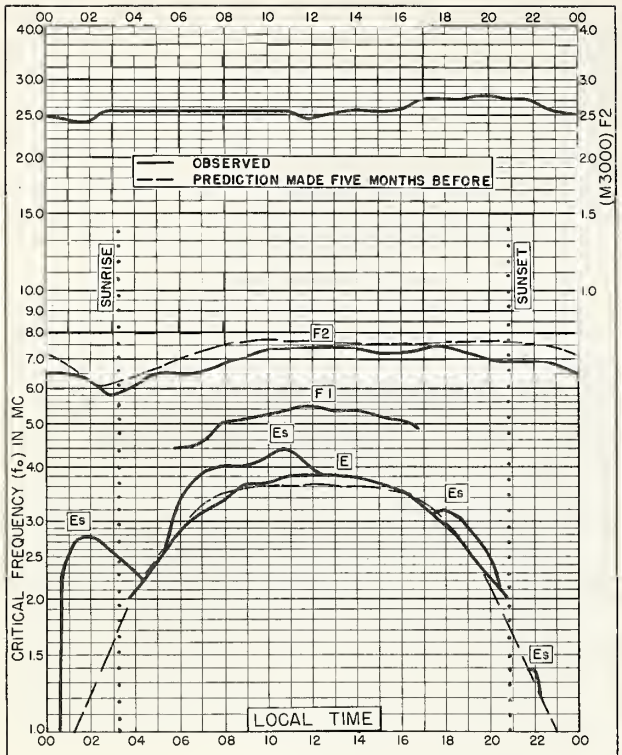

Fig. 45. OSLO, NORWAY
60.0°N, 11.1°E JULY 1957

NBS 503

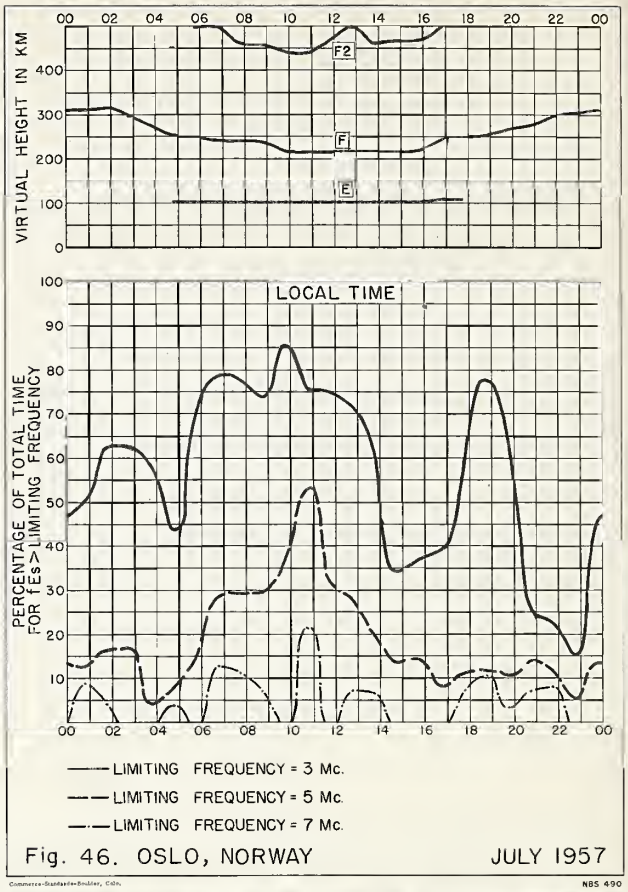

Fig. 46. OSLO, NORWAY JULY 1957

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NBS 490

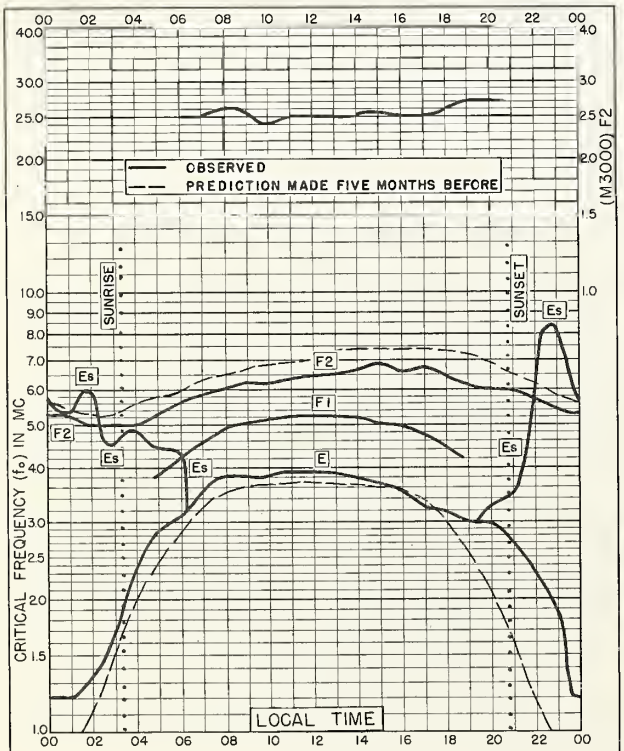

Fig. 47. CHURCHILL, CANADA
58.8°N, 94.2°W JULY 1957

NBS 503

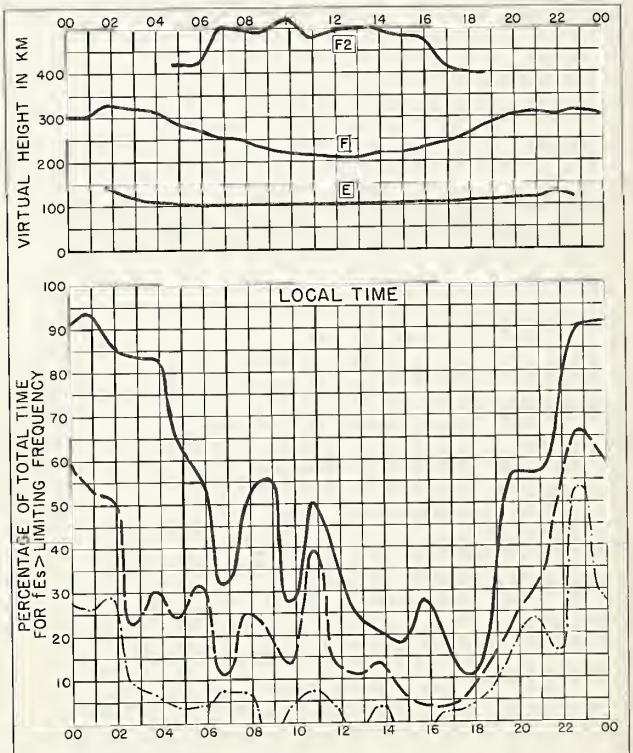

Fig. 48. CHURCHILL, CANADA JULY 1957

Commerce-Standards-Boulder, Colo.

NBS 490

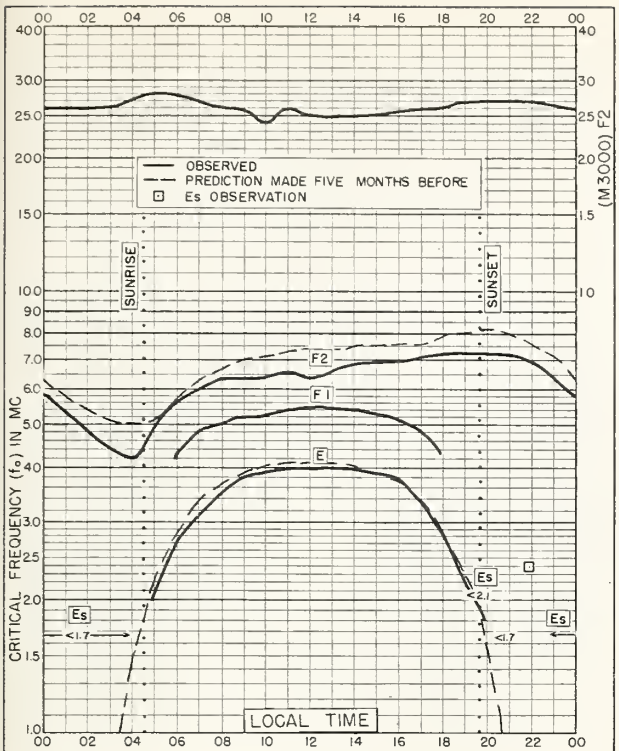

Fig. 49. OTTAWA, CANADA
45.4°N, 75.9° W JULY 1957

NBS 503

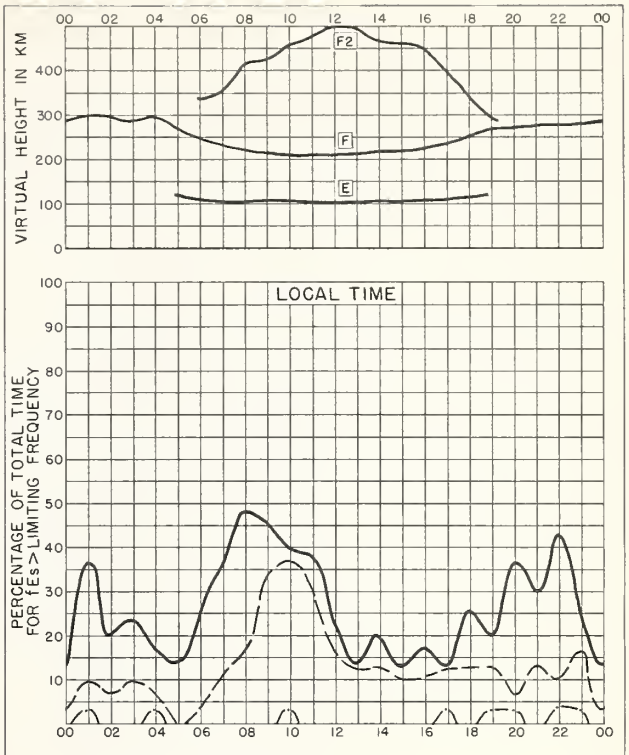

Fig. 50. OTTAWA, CANADA JULY 1957

NBS 490

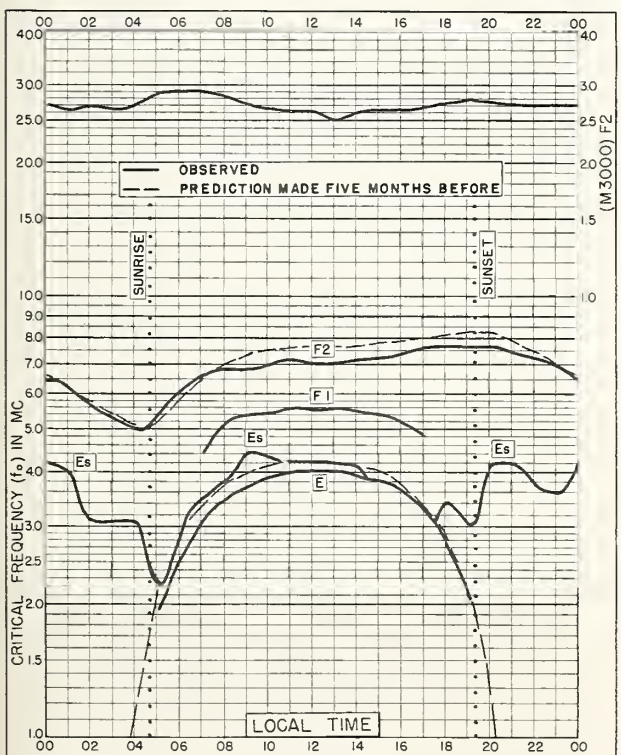

Fig. 51. FT. MONMOUTH, NEW JERSEY
40.3°N, 74.1°W JULY 1957

NBS 503

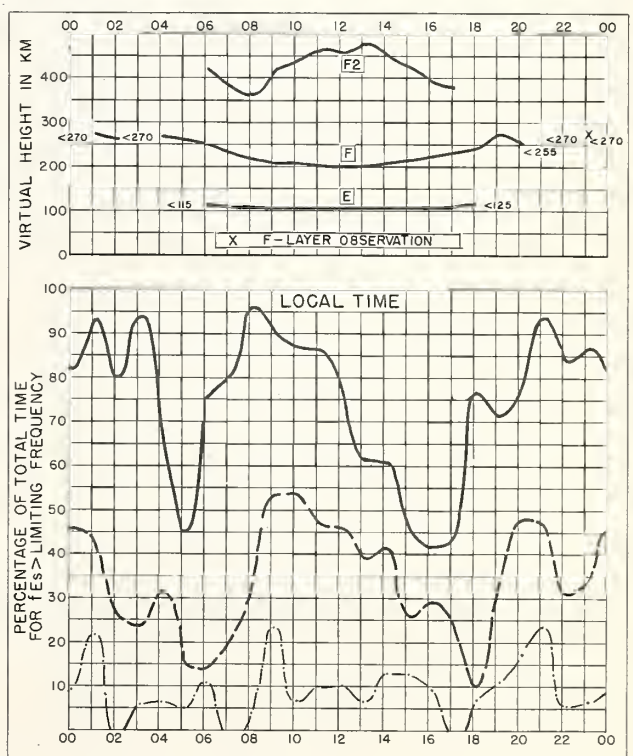

Fig. 52. FT. MONMOUTH, NEW JERSEY JULY 1957

NBS 490

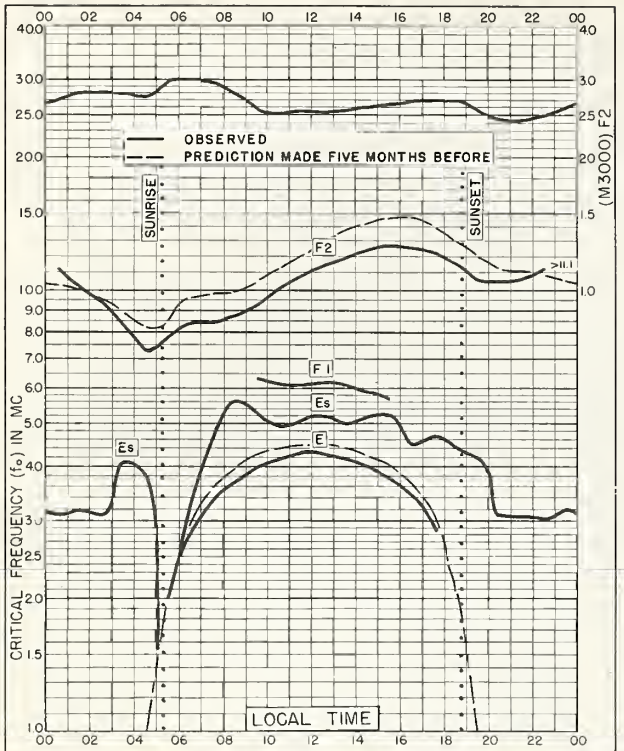

Fig. 53. OKINAWA I.
26.3°N, 127.8°E JULY 1957

NBS 503

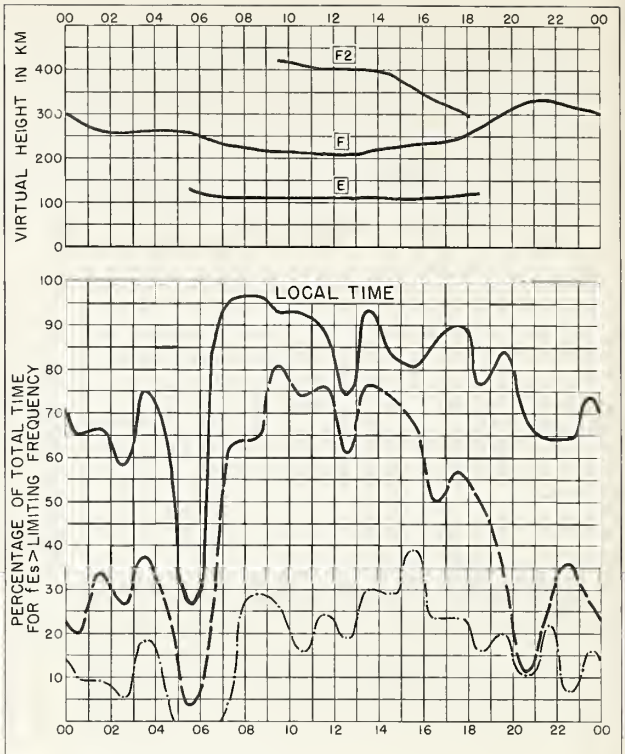

Fig. 54. OKINAWA I. JULY 1957

NBS 490

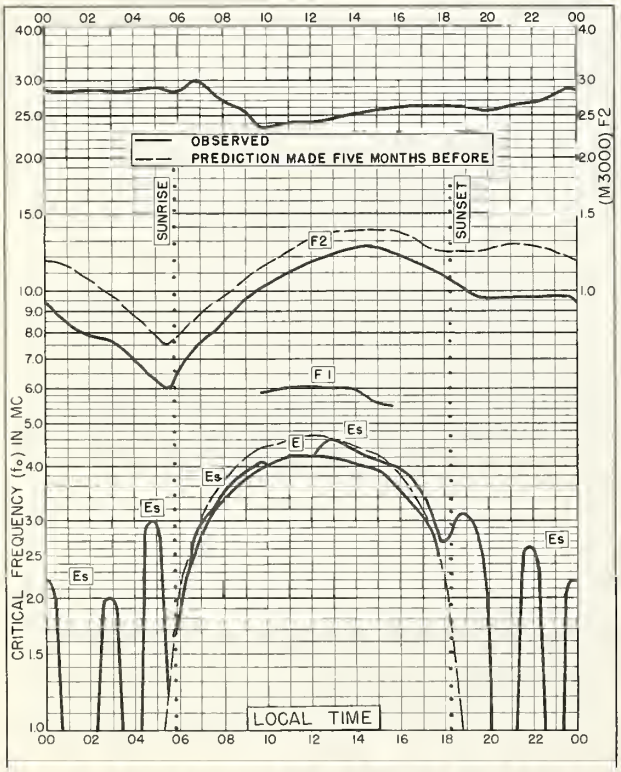

Fig. 55. PANAMA CANAL ZONE
9.4°N, 79.9°W JULY 1957

NBS 503

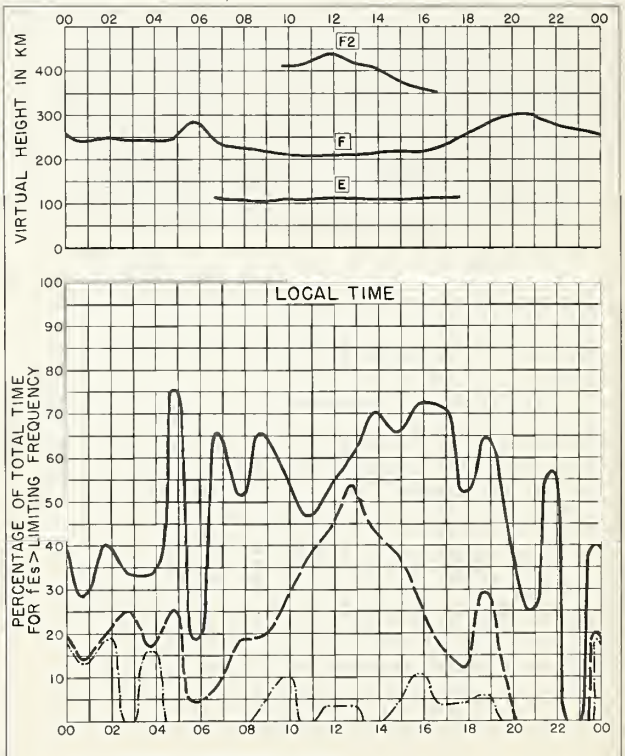

Fig. 56. PANAMA CANAL ZONE JULY 1957

NBS 490

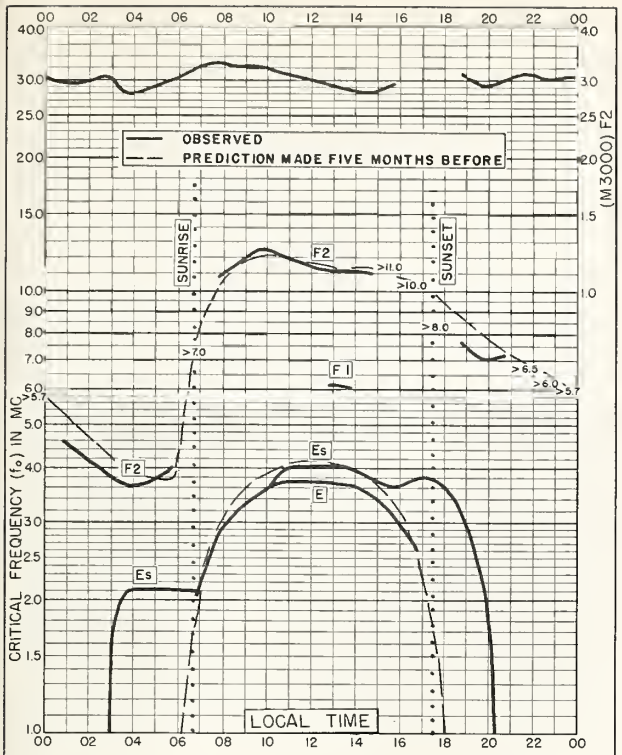

Fig. 57. TOWNSVILLE, AUSTRALIA
19.3°S, 146.7°E JULY 1957

NBS 503

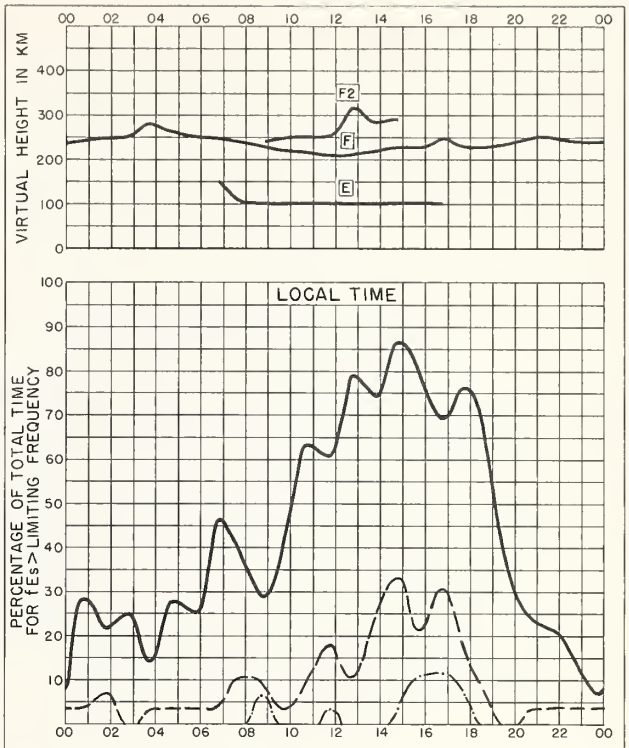

Fig. 58. TOWNSVILLE, AUSTRALIA JULY 1957

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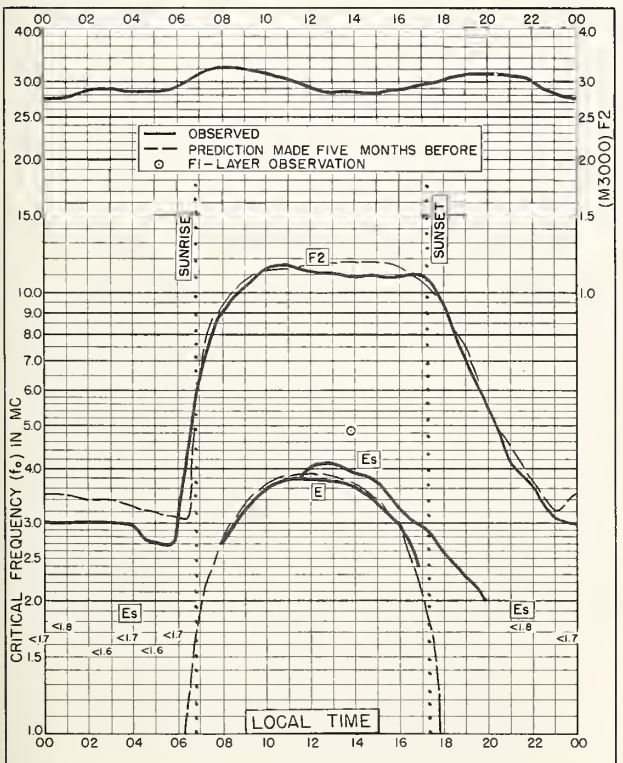

Fig. 59. JOHANNESBURG, UNION OF S. AFRICA
26.2°S, 28.0°E JULY 1957

NBS 503

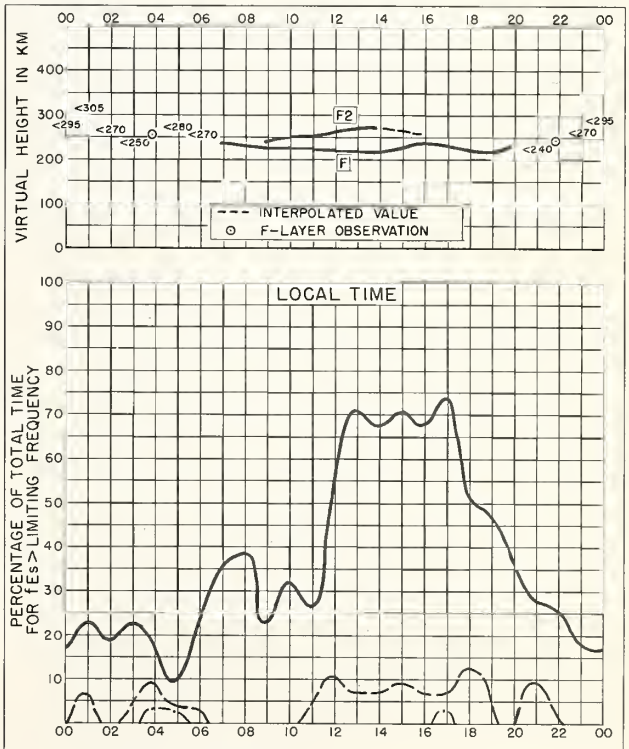

Fig. 60. JOHANNESBURG, UNION OF S. AFRICA JULY 1957

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NBS 490

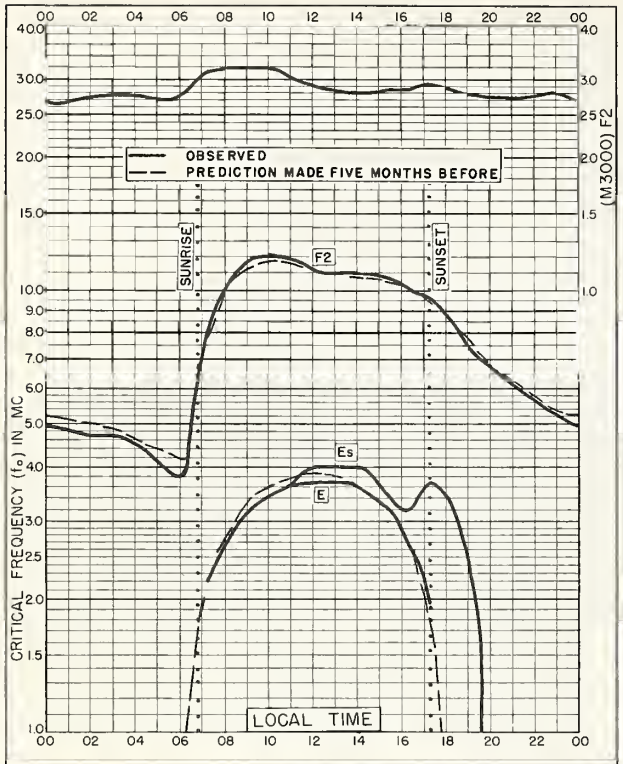

Fig. 61. BRISBANE, AUSTRALIA
27.5°S, 152.9°E JULY 1957

NBS 503

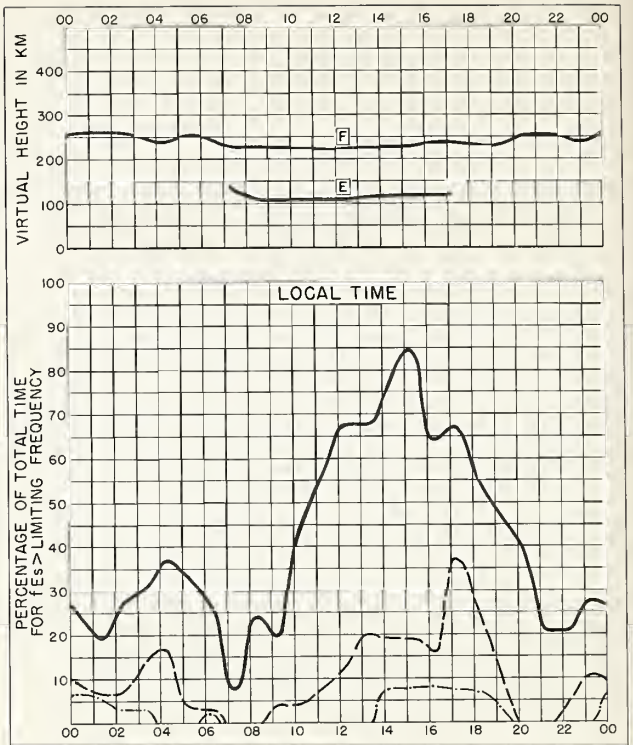

Fig. 62. BRISBANE, AUSTRALIA JULY 1957

NBS 490

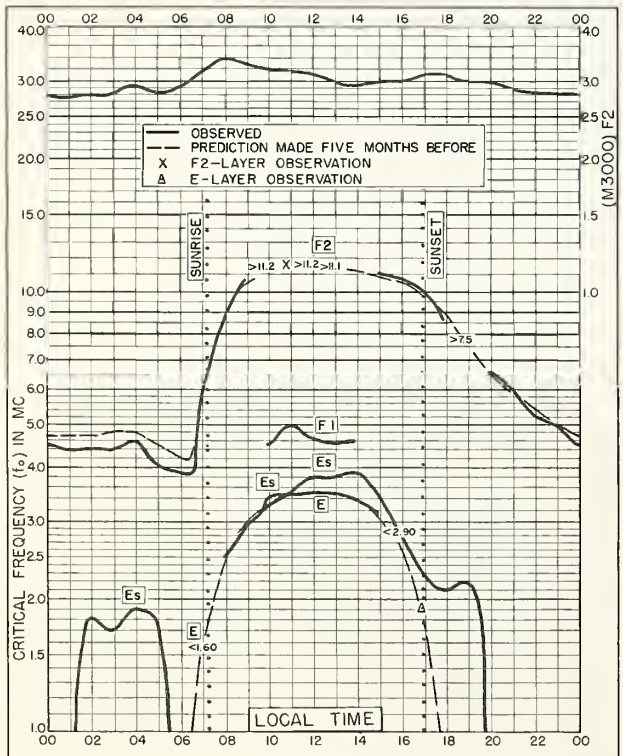

Fig. 63. CANBERRA, AUSTRALIA
35.3°S, 149.0°E JULY 1957

NBS 503

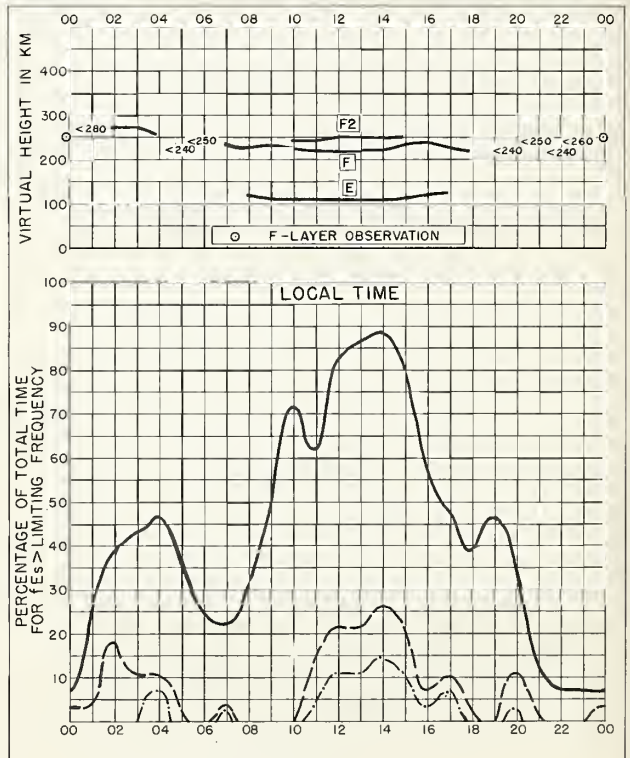

Fig. 64. CANBERRA, AUSTRALIA JULY 1957

NBS 490

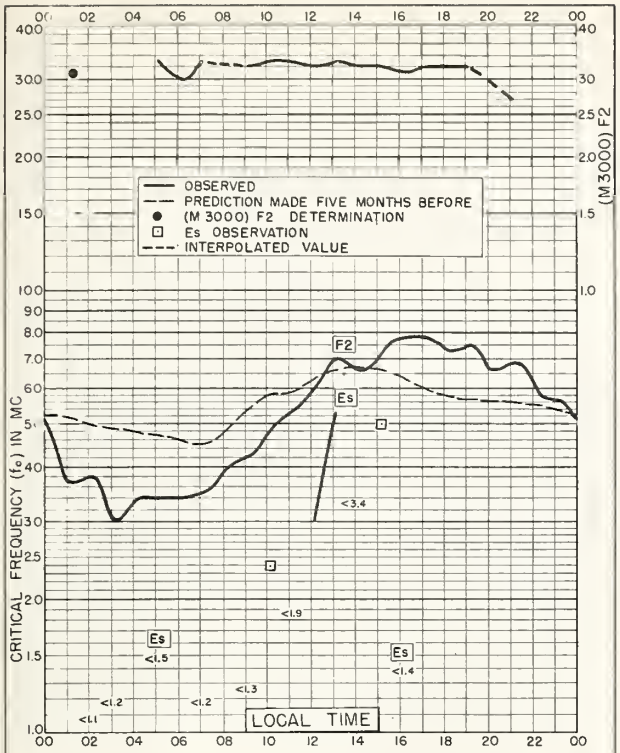

Fig. 65. SCOTT BASE
77.8°S, 166.8°E JULY 1957

NBS 503

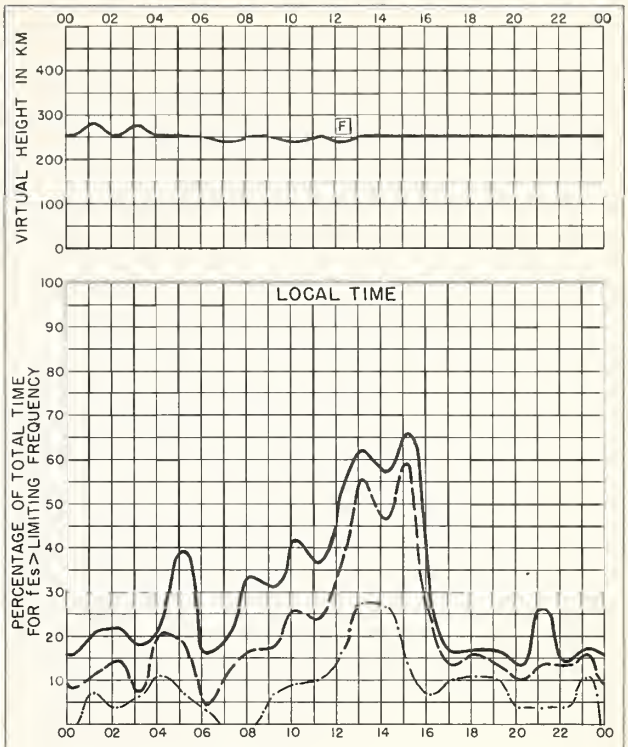

Fig. 66. SCOTT BASE JULY 1957

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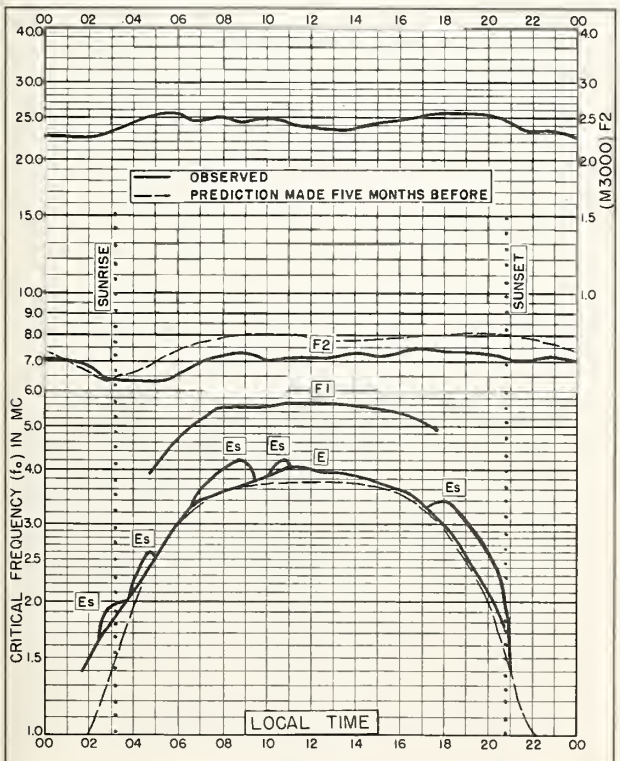

Fig. 67. INVERNESS, SCOTLAND
57.4°N, 4.2°W JUNE 1957

NBS 503

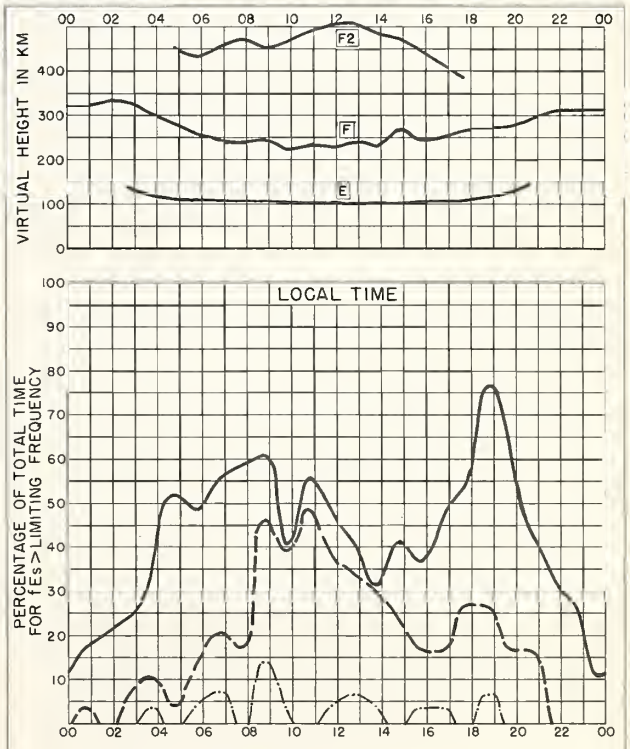

Fig. 68. INVERNESS, SCOTLAND JUNE 1957

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NBS 490

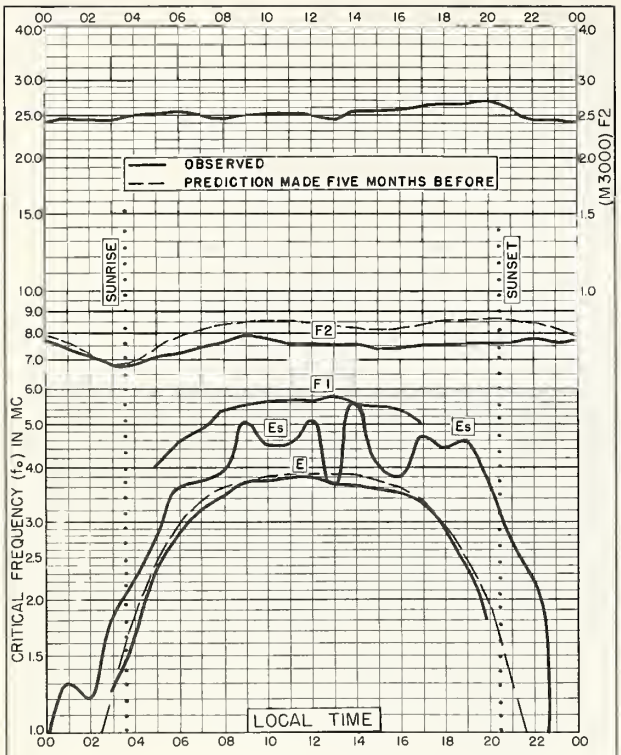

Fig. 69. JULIUSRUH/RÜGEN, GERMANY
54.6°N, 13.4°E JUNE 1957

NBS 503

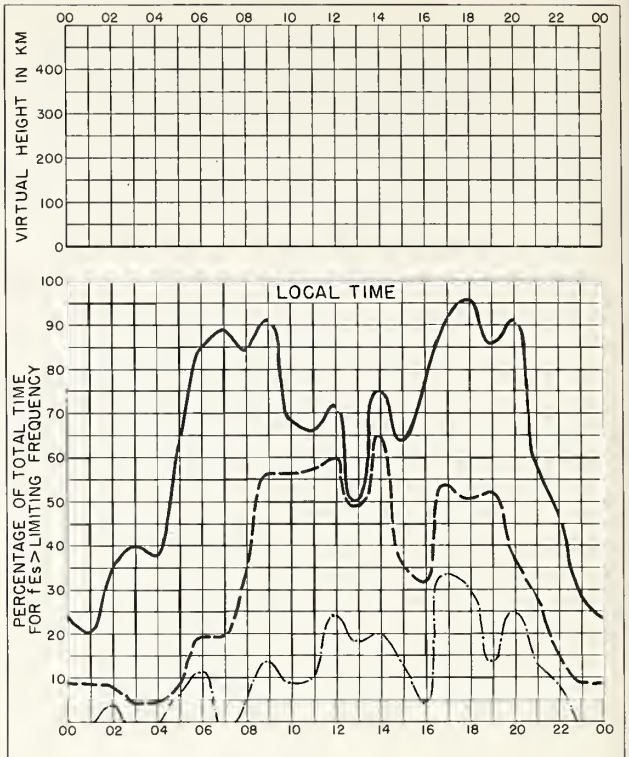

Fig. 70. JULIUSRUH/RÜGEN, GERMANY JUNE 1957

Commerce-Standards-Boulder, Colo.

NBS 490

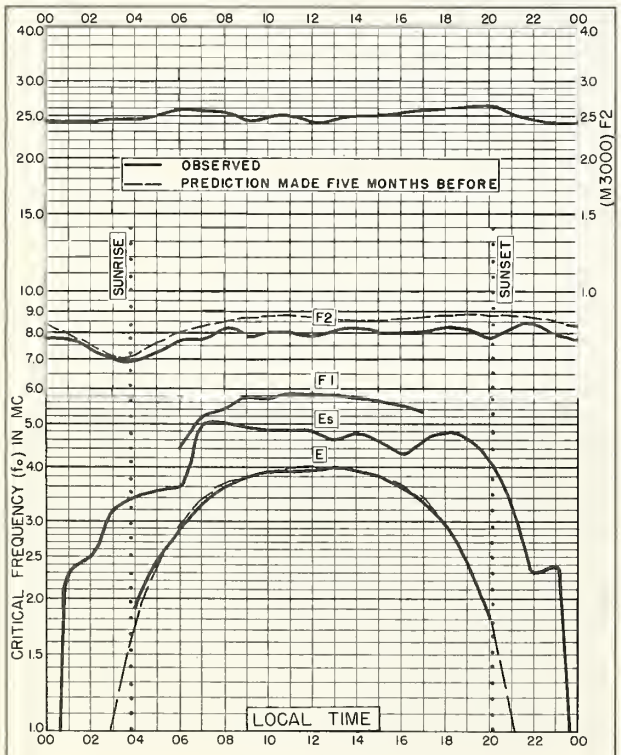

Fig. 71. SLOUGH, ENGLAND
51.5°N, 0.6° W JUNE 1957

NBS 503

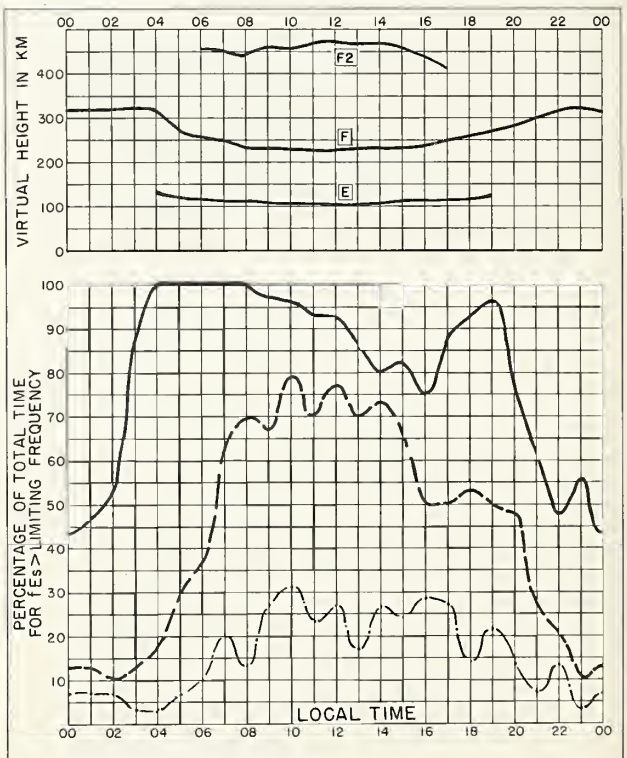

Fig. 72. SLOUGH, ENGLAND JUNE 1957

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NBS 490

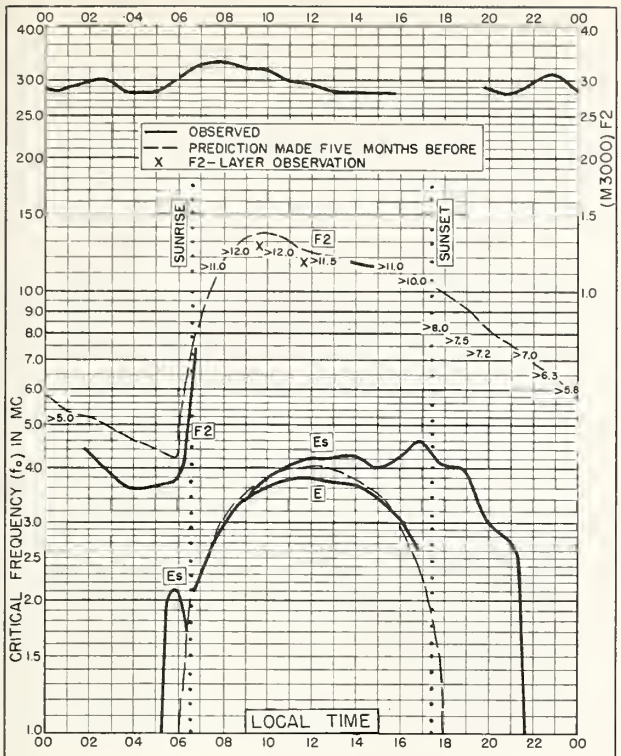


Fig. 73. TOWNSVILLE, AUSTRALIA
19.3°S, 146.7°E JUNE 1957

NBS 503

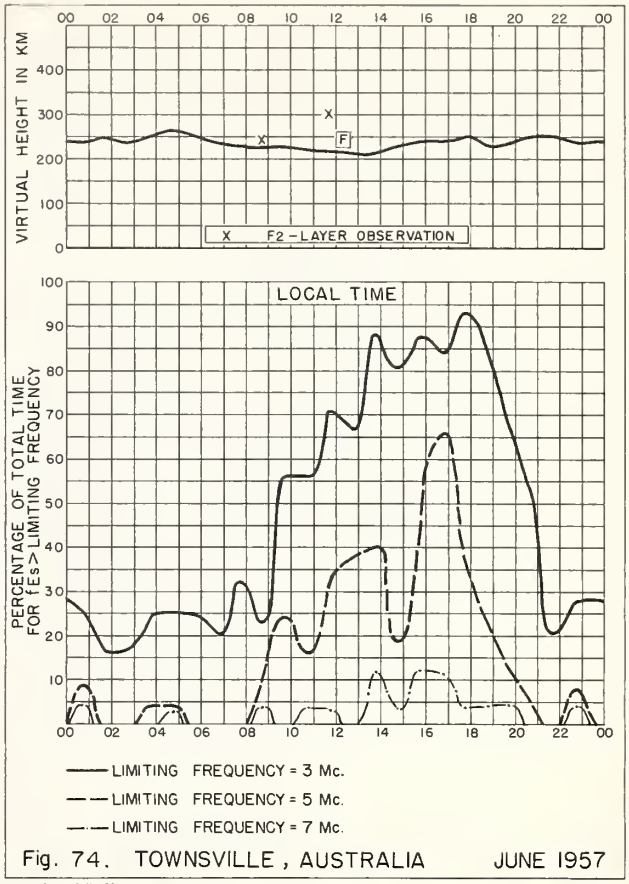


Fig. 74. TOWNSVILLE, AUSTRALIA JUNE 1957

NBS 490

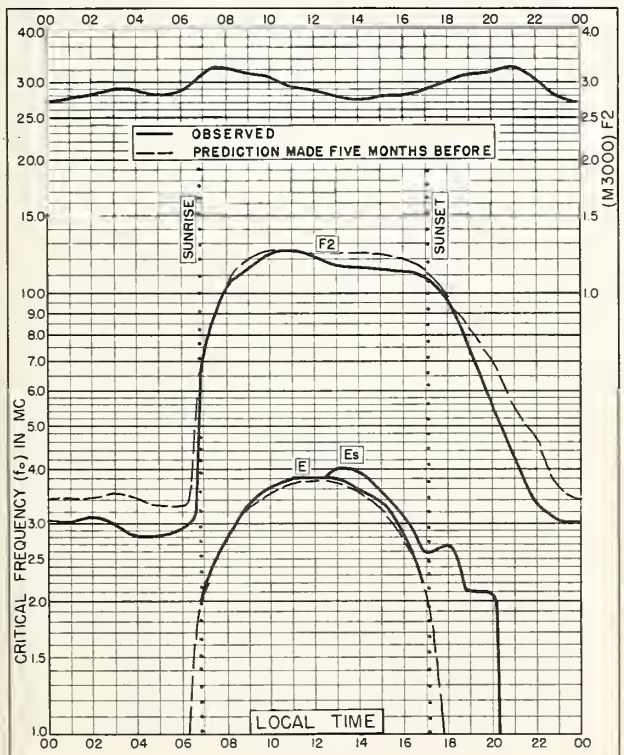


Fig. 75. JOHANNESBURG, UNION OF S. AFRICA
26.2°S, 28.0°E JUNE 1957

NBS 503

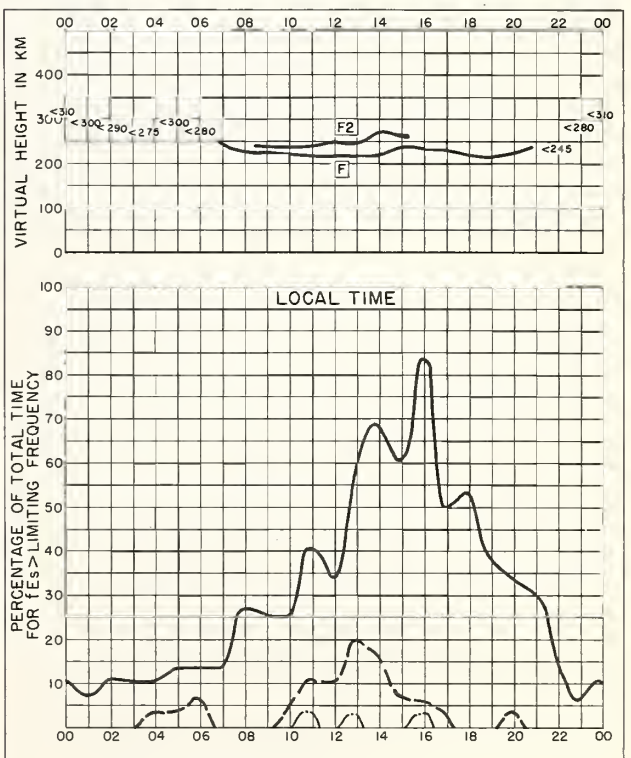


Fig. 76. JOHANNESBURG, UNION OF S. AFRICA JUNE 1957

NBS 490

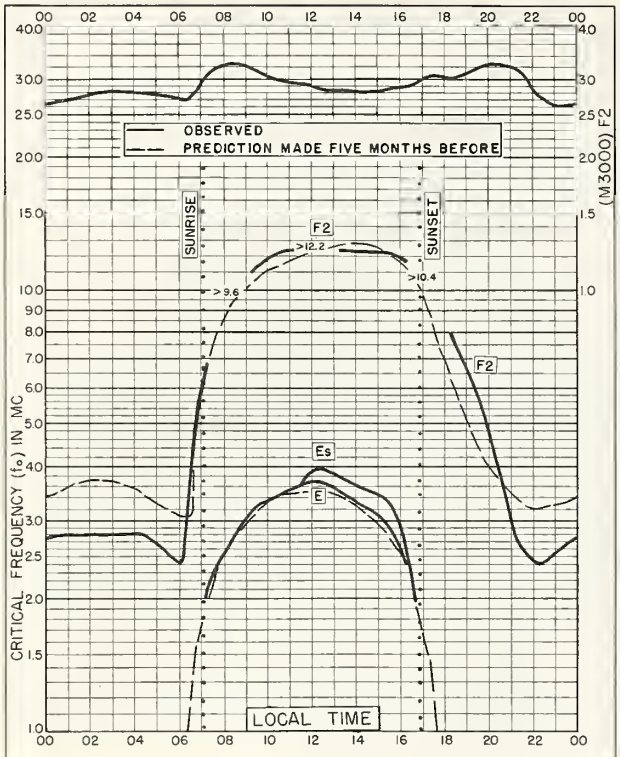
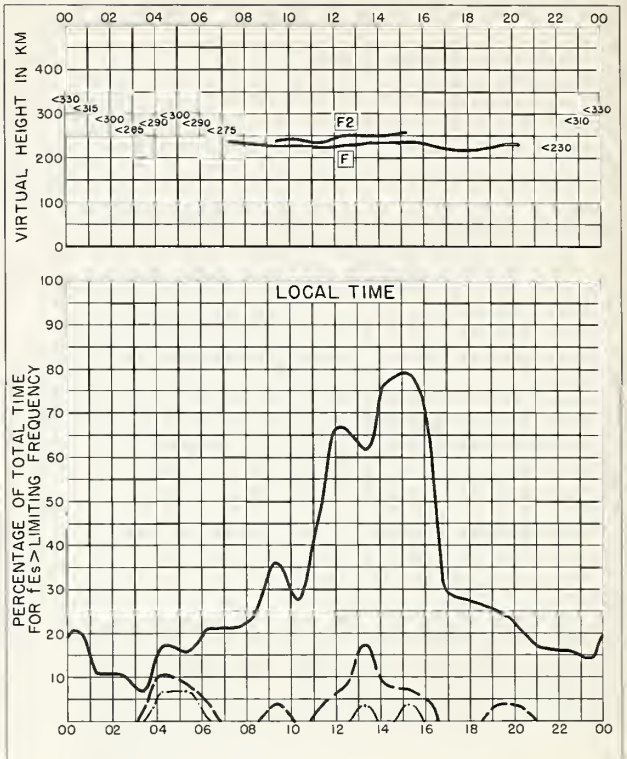


Fig. 77. CAPETOWN, UNION OF S. AFRICA
34.1°S, 18.3°E JUNE 1957

NBS 503



JUNE 1957

Fig. 78. CAPETOWN, UNION OF S. AFRICA

NBS 490

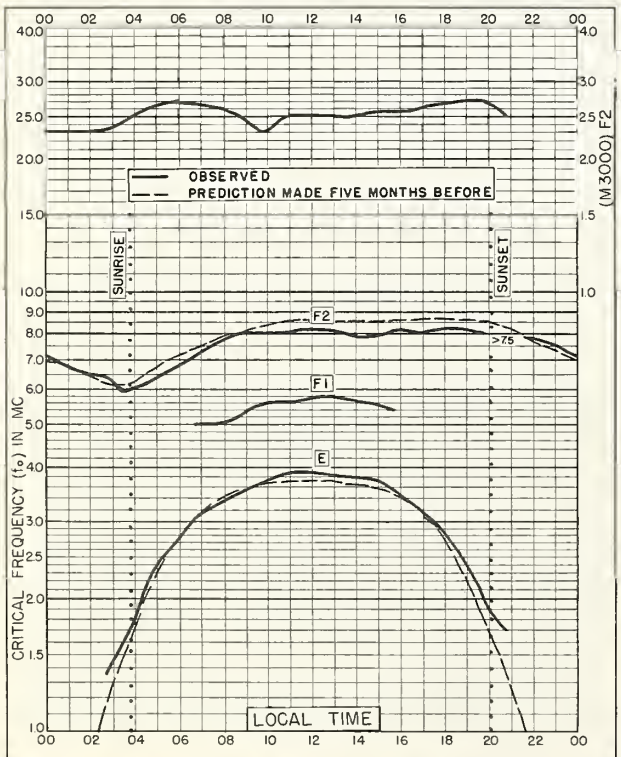


Fig. 79. INVERNESS, SCOTLAND
57.4°N, 4.2°W MAY 1957

NBS 503

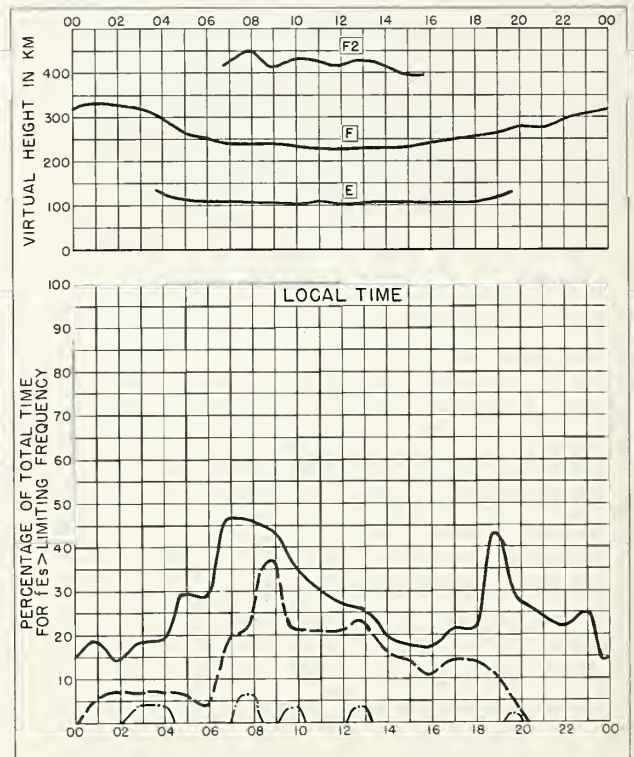


Fig. 80. INVERNESS, SCOTLAND MAY 1957

NBS 490

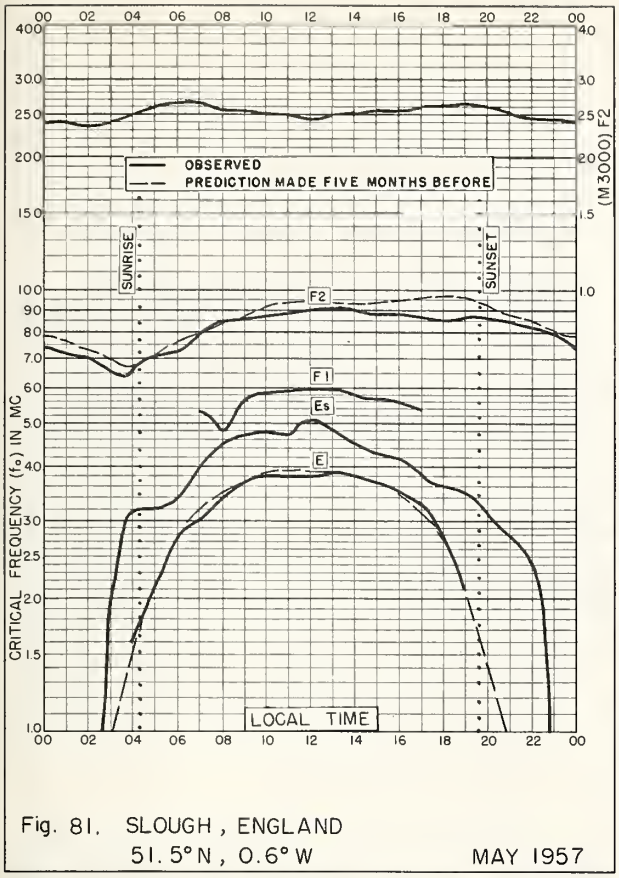


Fig. 81. SLOUGH, ENGLAND
51.5°N, 0.6°W MAY 1957

NBS 503

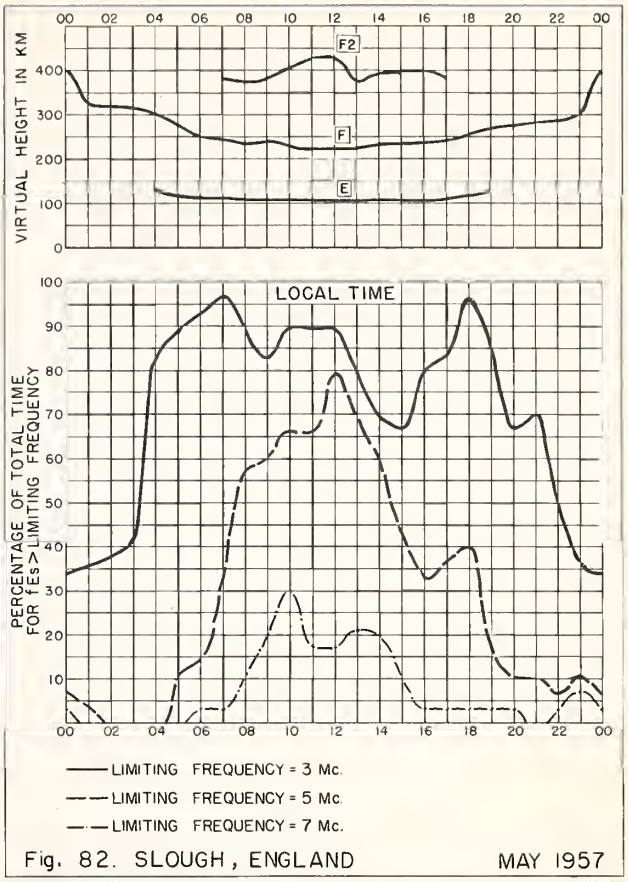


Fig. 82. SLOUGH, ENGLAND MAY 1957

NBS 490

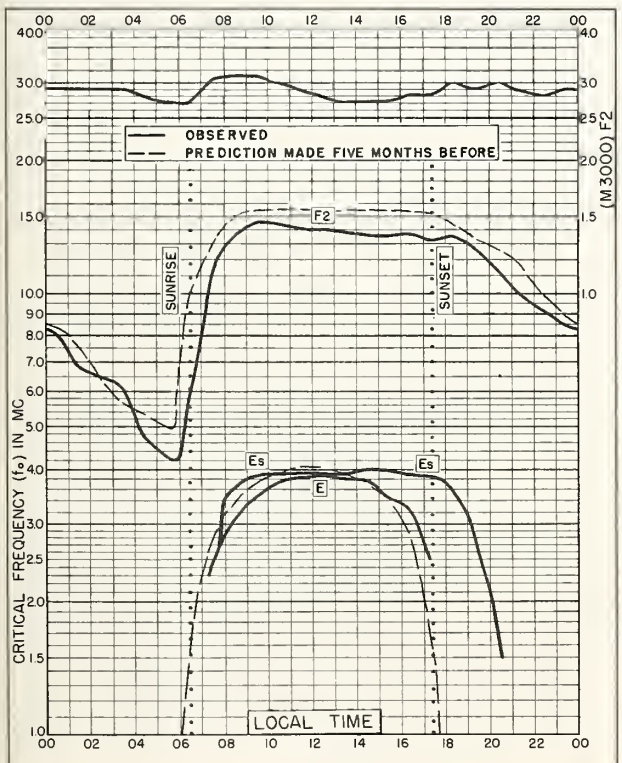


Fig. 83. RAROTONGA I.
21.2°S, 159.8°W MAY 1957

NBS 503

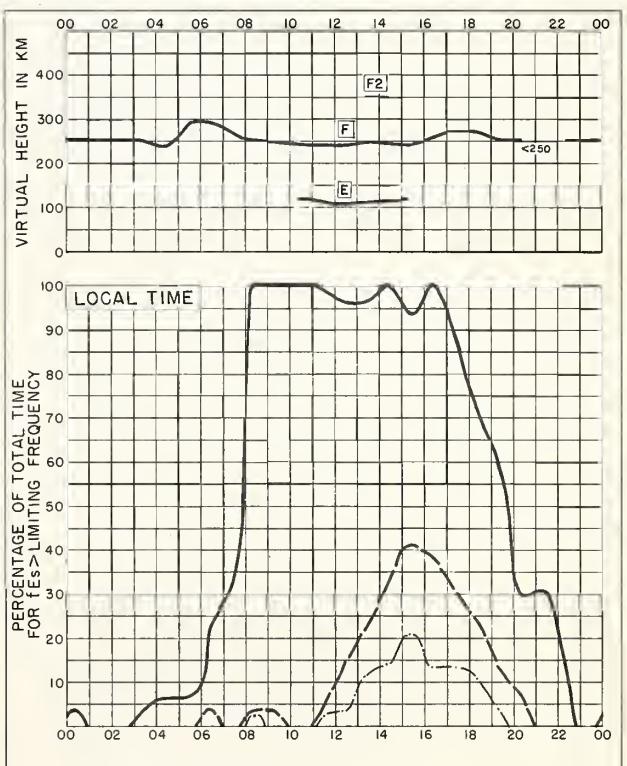


Fig. 84. RAROTONGA I. MAY 1957

NBS 490

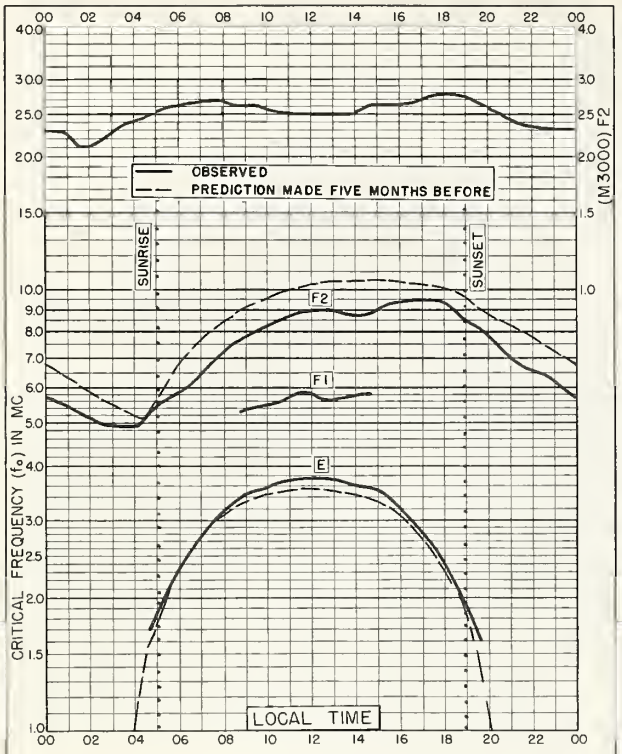


Fig. 85. INVERNESS, SCOTLAND
57.4°N, 4.2°W APRIL 1957

NBS 503

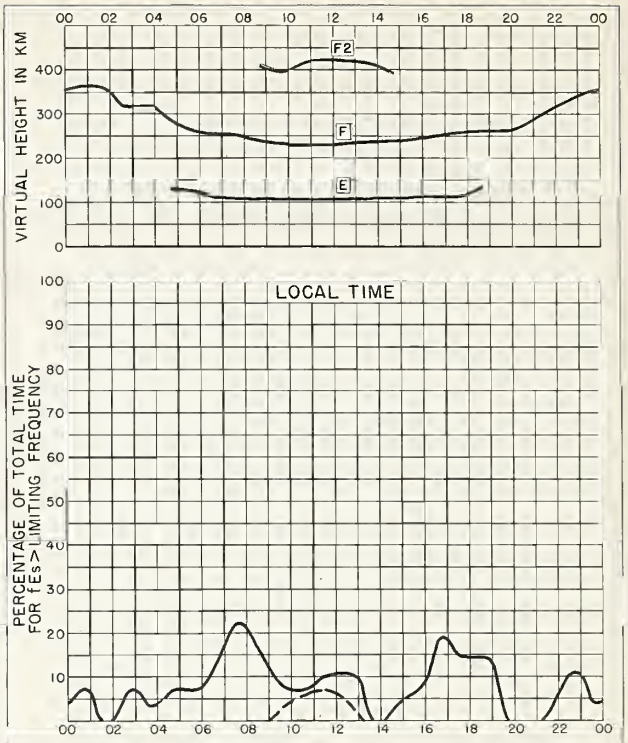


Fig. 86. INVERNESS, SCOTLAND APRIL 1957

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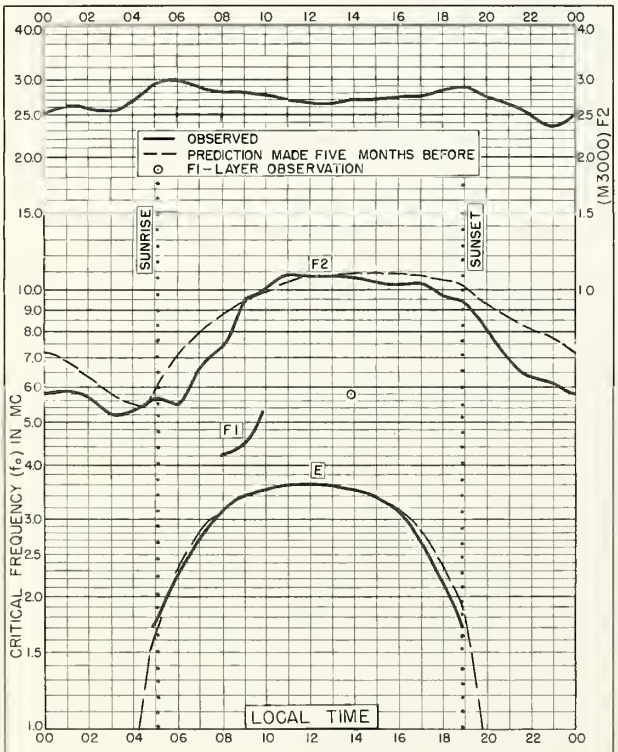

Fig. 87. JULIUSRUH/RÜGEN, GERMANY
54.6°N, 13.4°E APRIL 1957

NBS 503

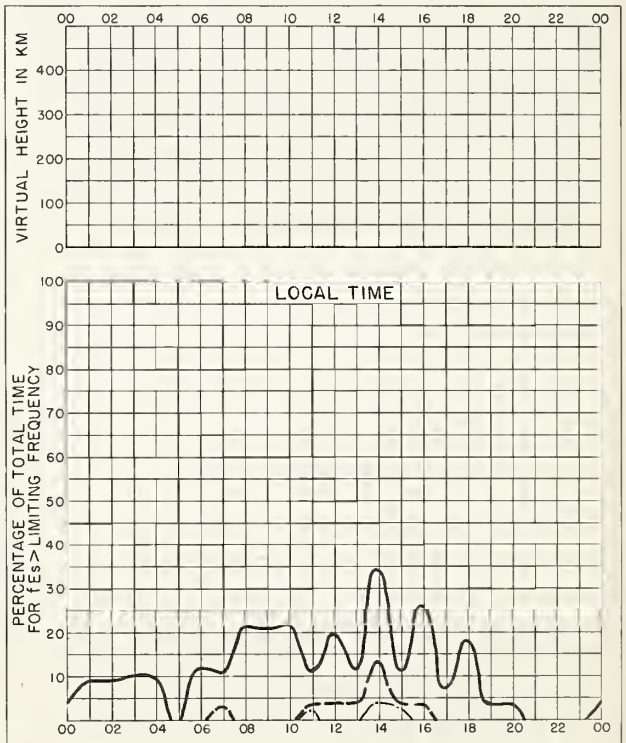

Fig. 88. JULIUSRUH/RÜGEN, GERMANY APRIL 1957

Commerce-Standards-Boulder, Colo.

NBS 490

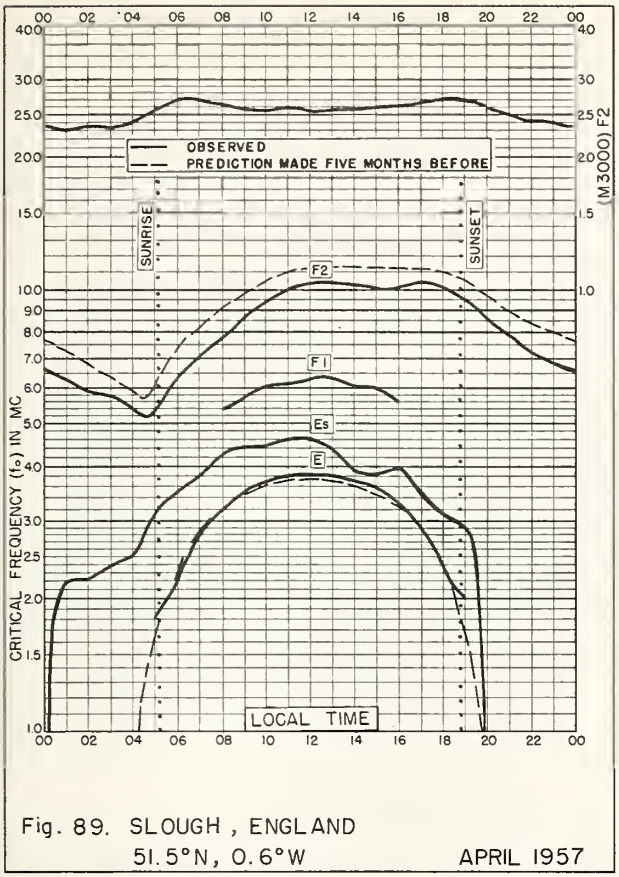

Fig. 89. SLOUGH, ENGLAND
51.5°N, 0.6°W APRIL 1957

NBS 503

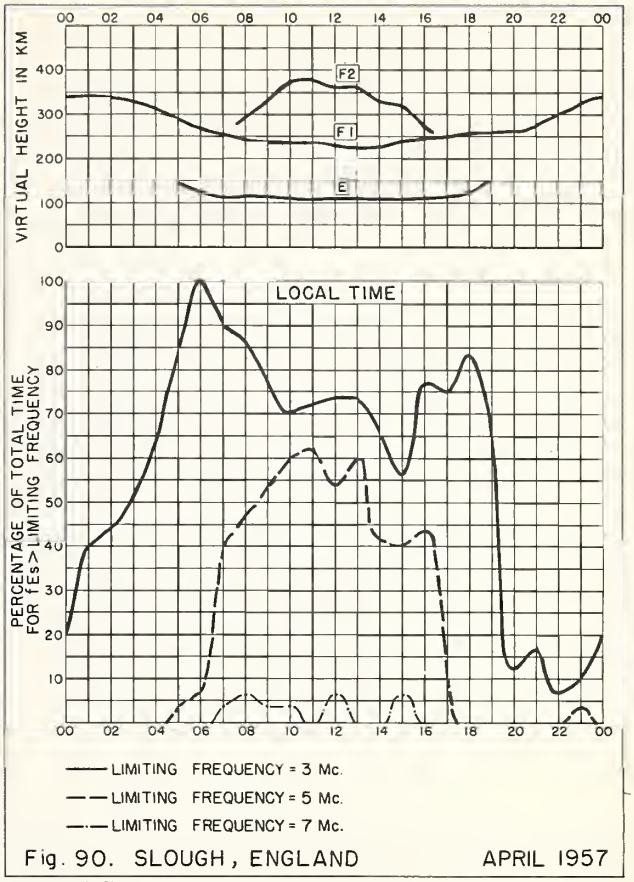

Fig. 90. SLOUGH, ENGLAND APRIL 1957

Commerce-Standards-Boulder, Colo.

NBS 490

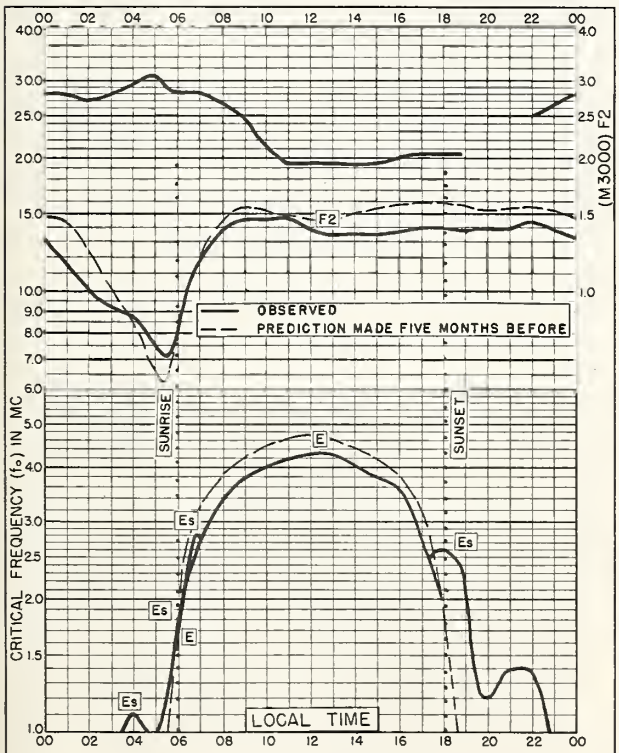

Fig. 91. SINGAPORE, BRITISH MALAYA
1.3°N, 103.8°E APRIL 1957

NBS 503

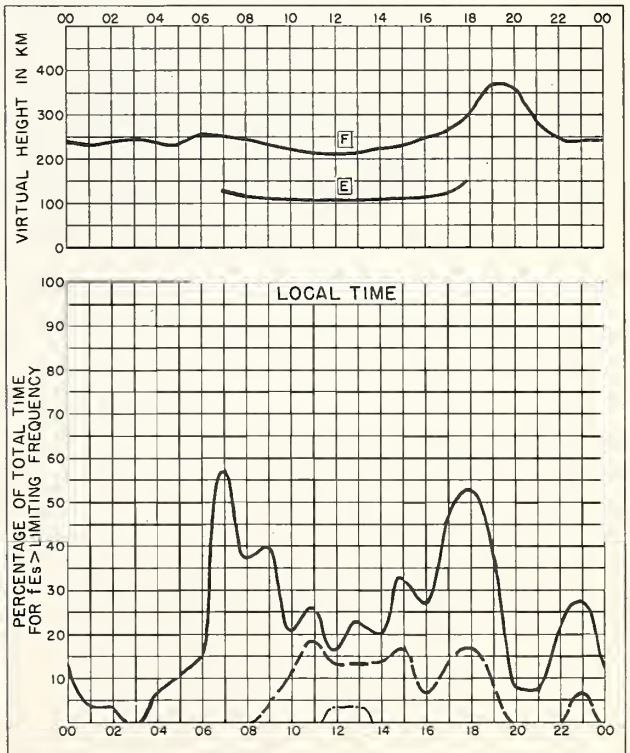

Fig. 92. SINGAPORE, BRITISH MALAYA APRIL 1957

Commerce-Standards-Boulder, Colo.

NBS 490

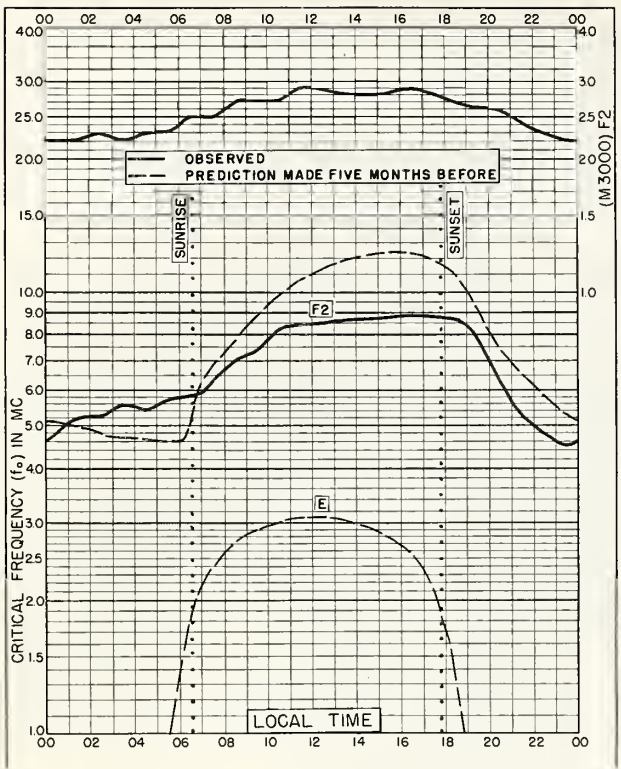

Fig. 93. PROVIDENIE BAY, U.S.S.R.
64.4°N, 186.6°E MARCH 1957

NBS 503

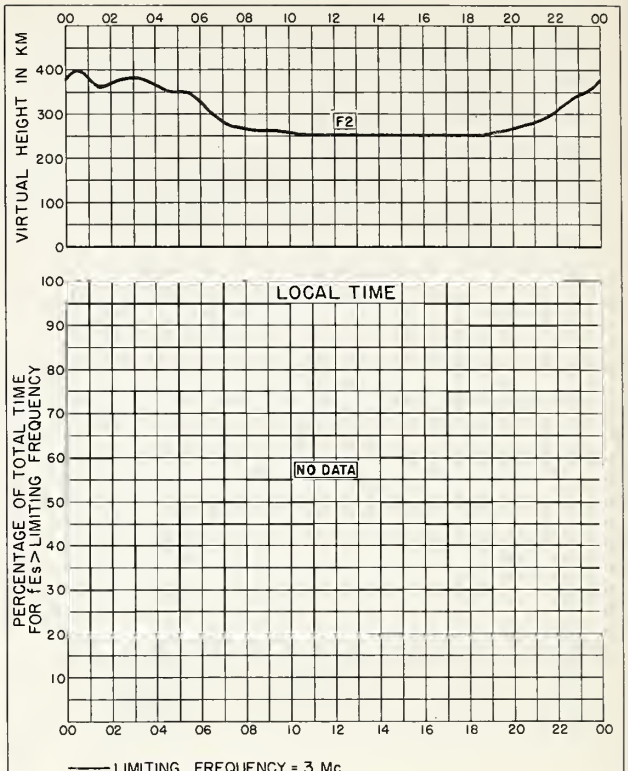

Fig. 94. PROVIDENIE BAY, U.S.S.R. MARCH 1957

Commerce-Standards-Boulder, Colo.

NBS 490

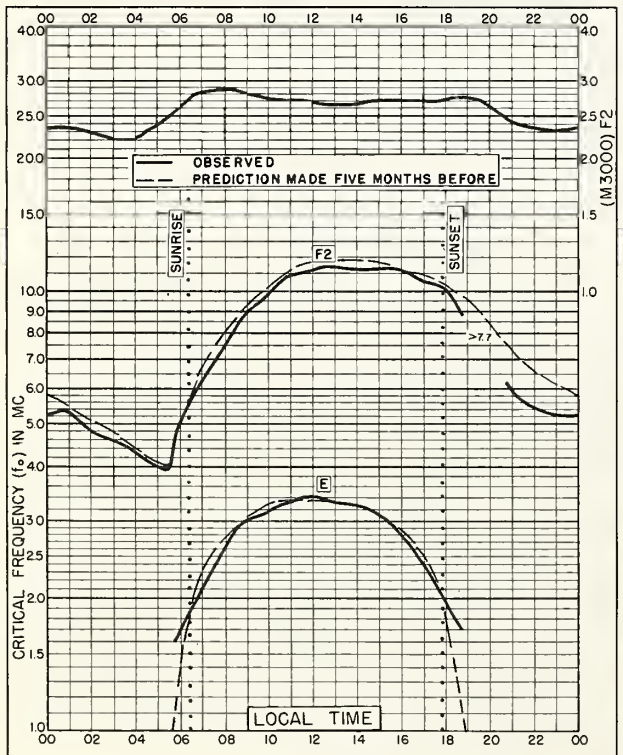

Fig. 95. INVERNESS, SCOTLAND
57.4°N, 4.2° W MARCH 1957

NBS 503

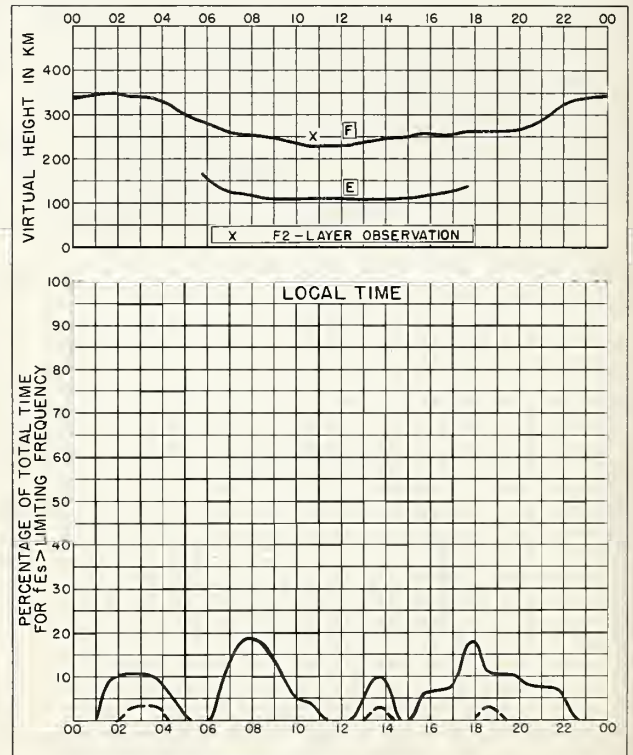

Fig. 96. INVERNESS, SCOTLAND MARCH 1957

Commerce-Standards-Boulder, Colo.

NBS 490

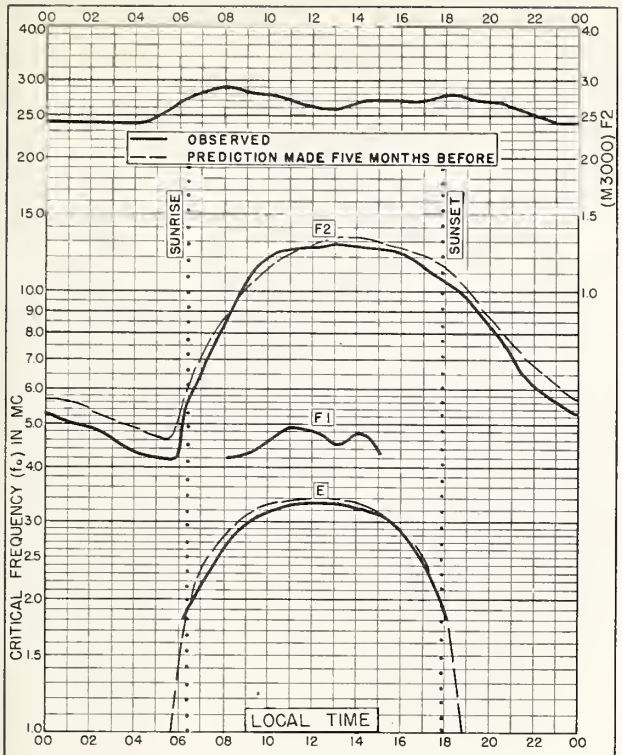

Fig. 97. SVERDLOVSK, U.S.S.R.
56.7°N, 61.1°E MARCH 1957

NBS 503

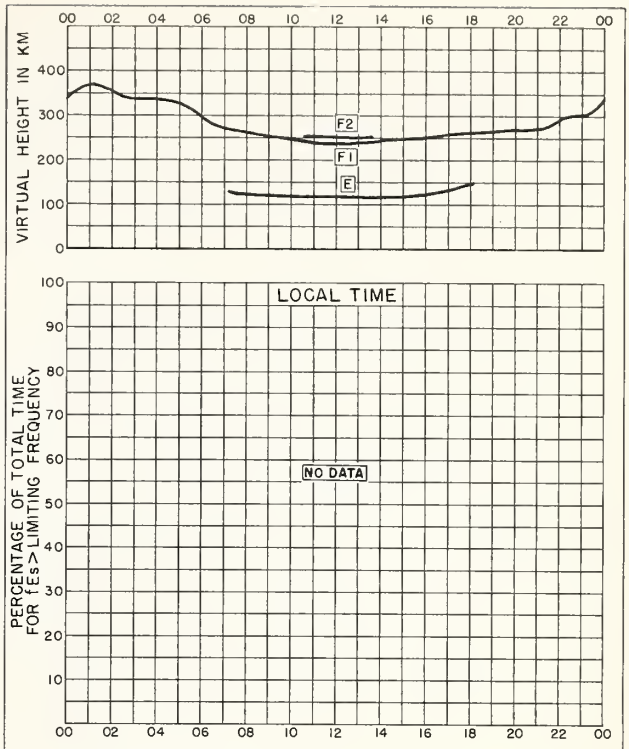

Fig. 98. SVERDLOVSK, U.S.S.R. MARCH 1957

Commerce-Stanfarts-Boulder, Colo.

NBS 490

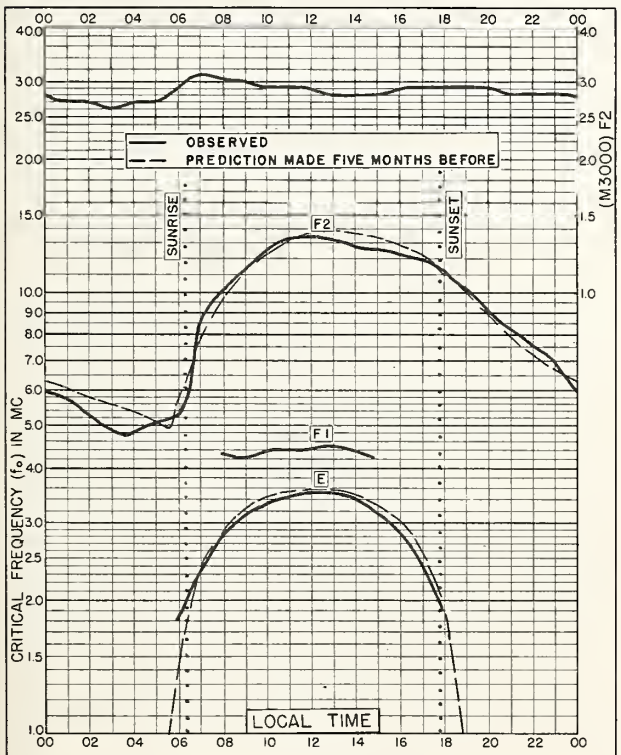

Fig. 99. IRKUTSK, U.S.S.R.
52.5°N, 104.0°E MARCH 1957

NBS 503

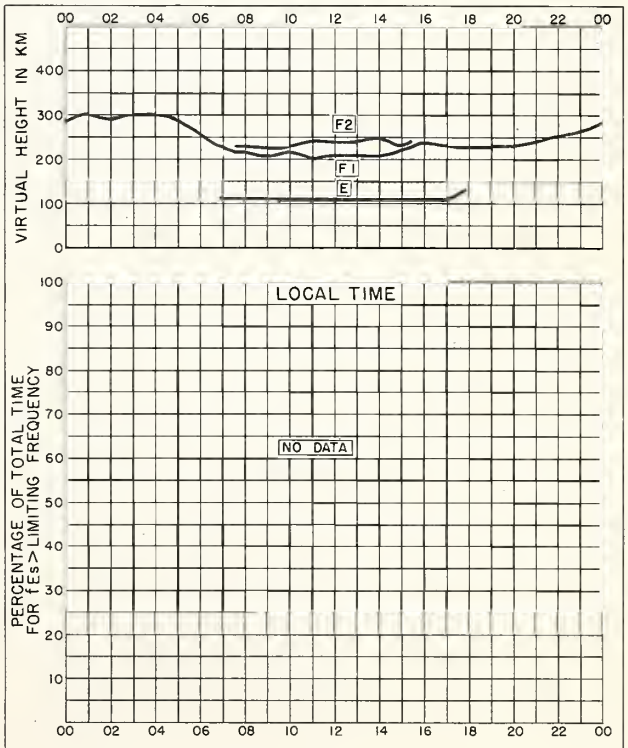

Fig. 100. IRKUTSK, U.S.S.R. MARCH 1957

Commerce-Stanfarts-Boulder, Colo.

NBS 490

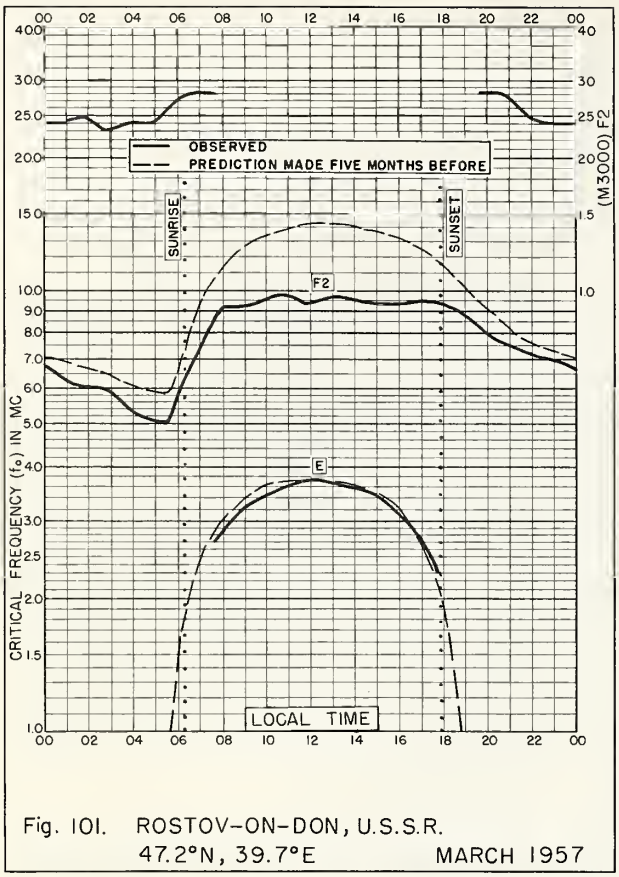

Fig. 101. ROSTOV-ON-DON, U.S.S.R.
47.2°N, 39.7°E MARCH 1957

NBS 503

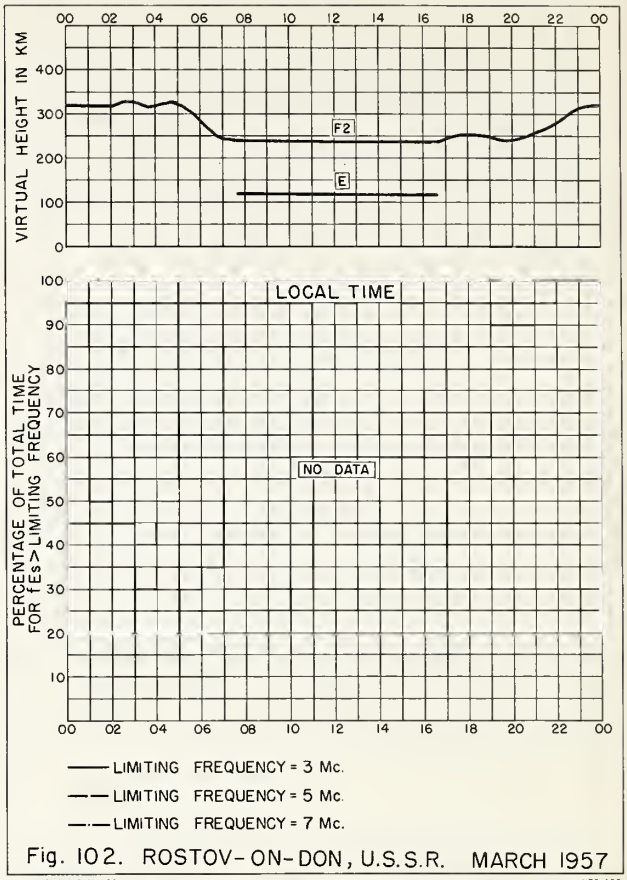

Fig. 102. ROSTOV-ON-DON, U.S.S.R. MARCH 1957

Commerce-Standards-Boulder, Colo.

NBS 490

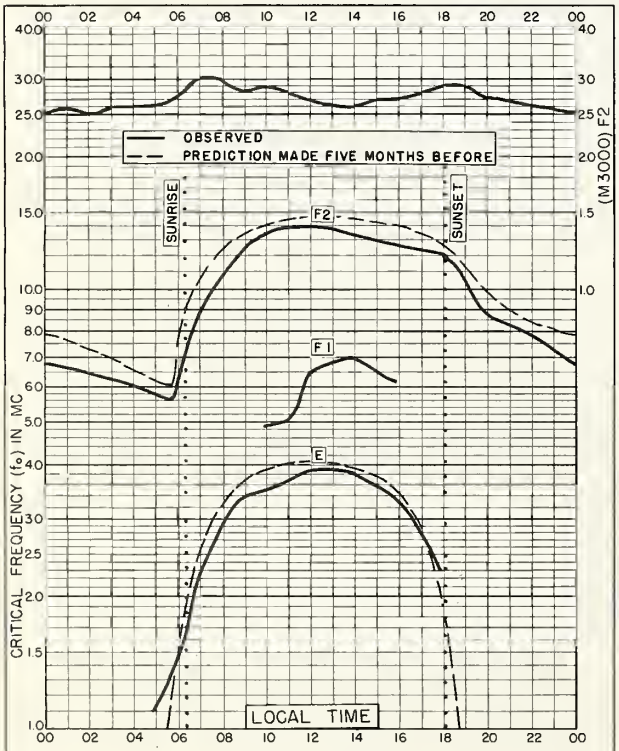

Fig. 103. ASHKHABAD, U.S.S.R.
37.9°N, 58.3°E MARCH 1957

NBS 503

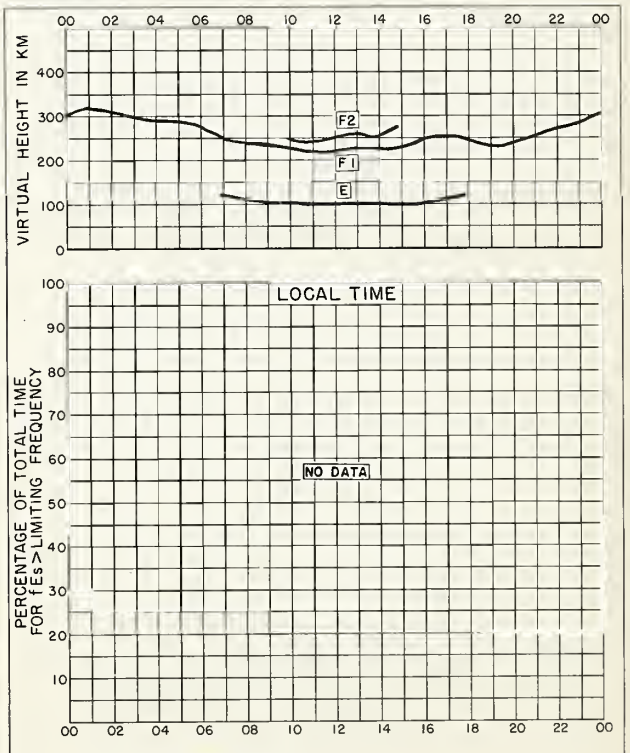

Fig. 104. ASHKHABAD, U.S.S.R. MARCH 1957

Commerce-Standards-Boulder, Colo.

NBS 490

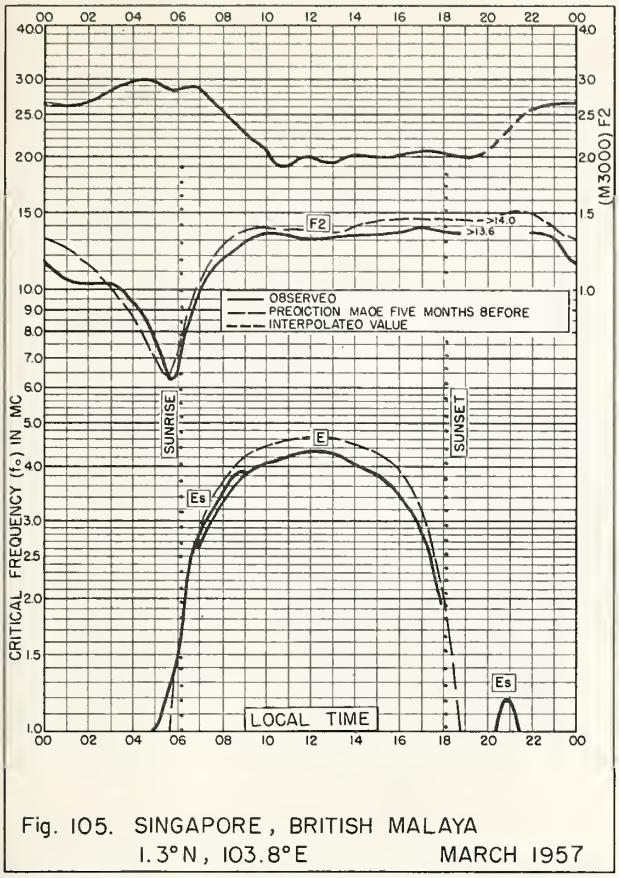

Fig. 105. SINGAPORE, BRITISH MALAYA
1.3°N, 103.8°E MARCH 1957

NBS 503

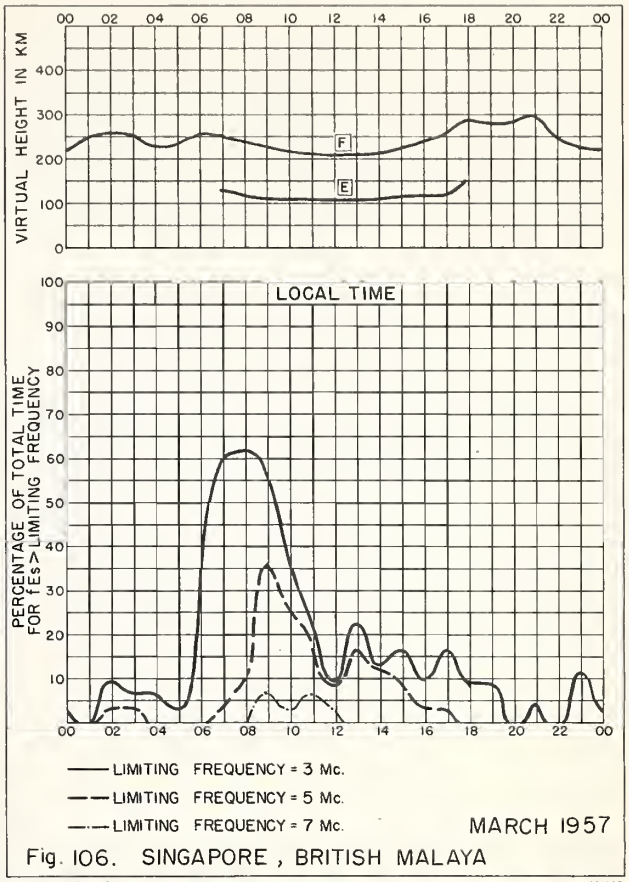

Fig. 106. SINGAPORE, BRITISH MALAYA MARCH 1957

NBS 490

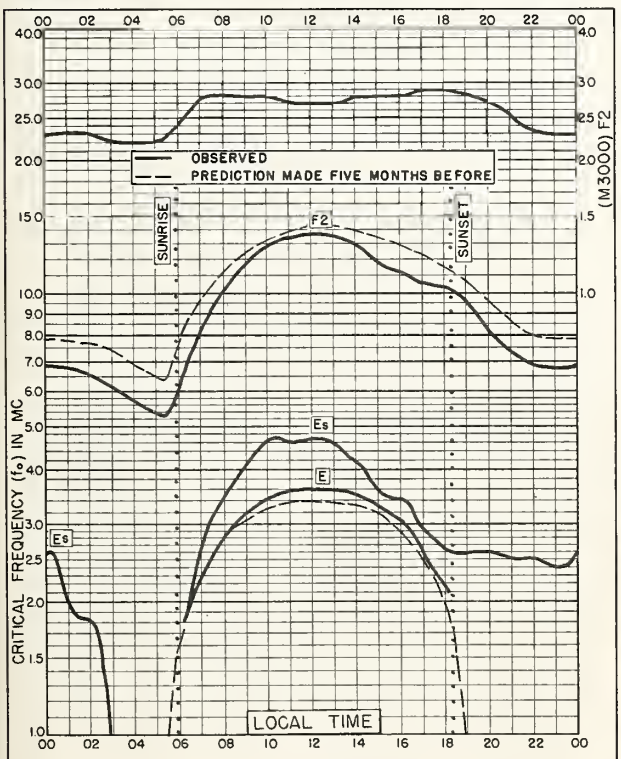

Fig. 107. FALKLAND IS.
51.7°S, 57.8°W MARCH 1957

NBS 503

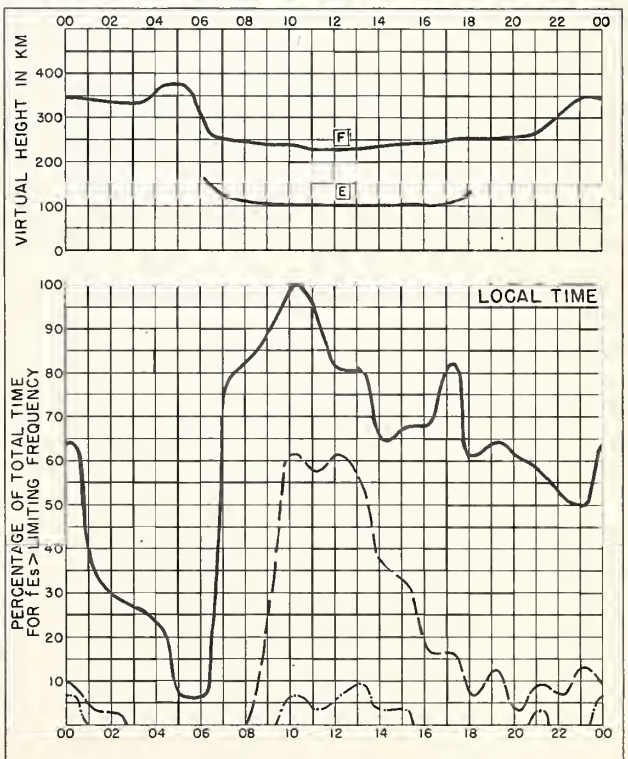

Fig. 108. FALKLAND IS. MARCH 1957

NBS 490

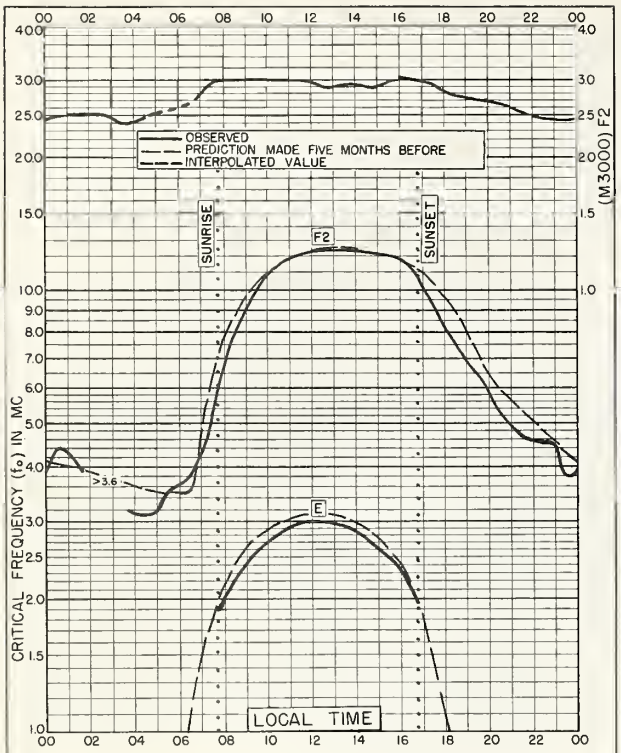

Fig. 109. INVERNESS, SCOTLAND
57.4°N, 4.2°W FEBRUARY 1957

NBS 503

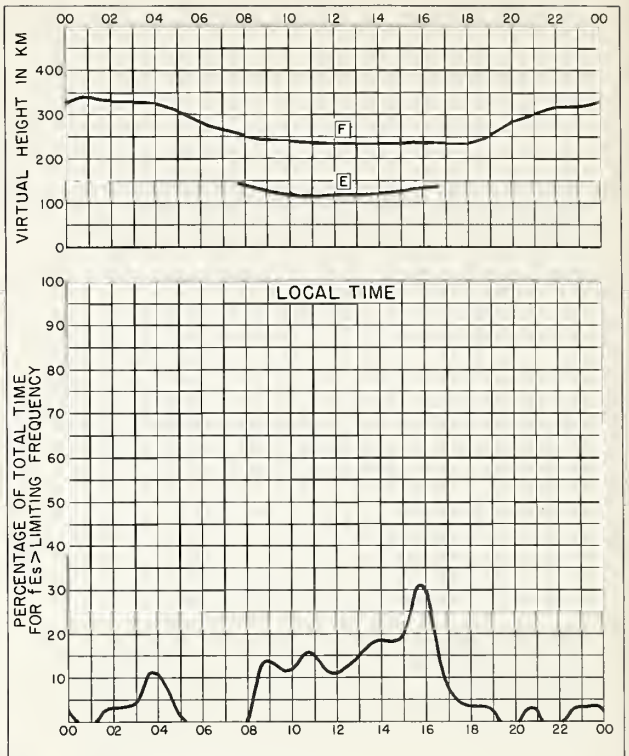

Fig. 110. INVERNESS, SCOTLAND FEBRUARY 1957

NBS 490

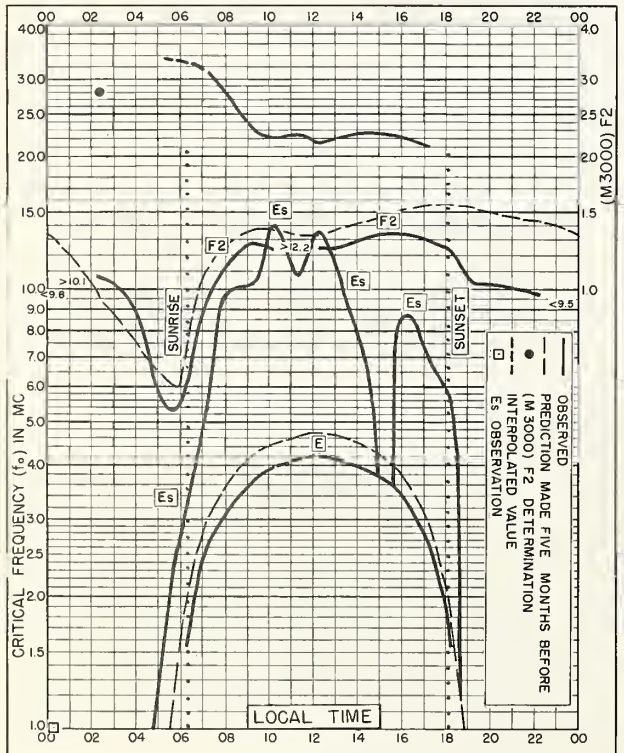

Fig. 111. IBADAN, NIGERIA
7.4°N, 3.9°E FEBRUARY 1957

NBS 503

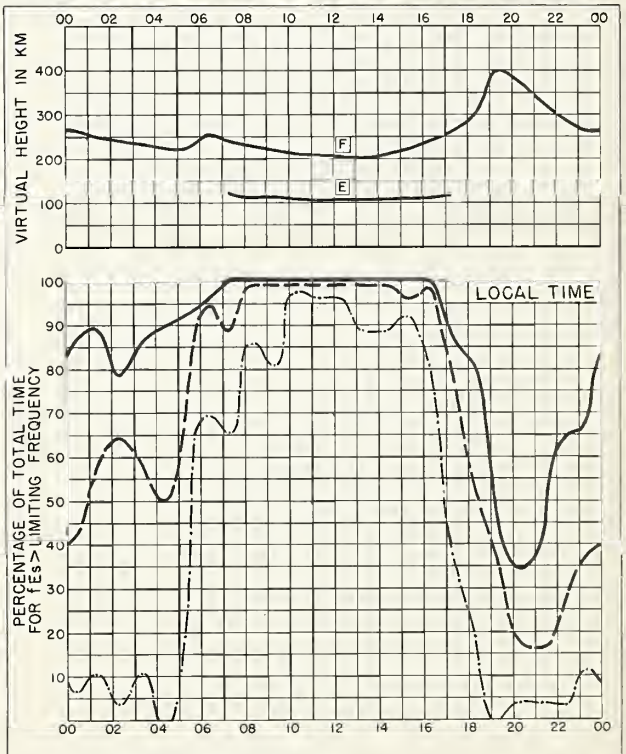

Fig. 112. IBADAN, NIGERIA FEBRUARY 1957

NBS 490

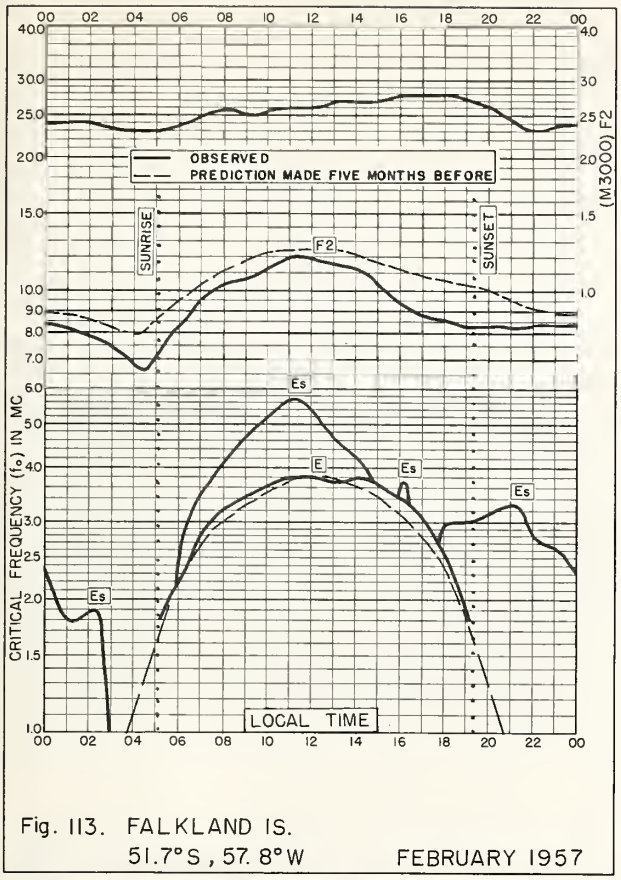

Fig. 113. FALKLAND IS.
51.7°S, 57.8°W FEBRUARY 1957

NBS 503

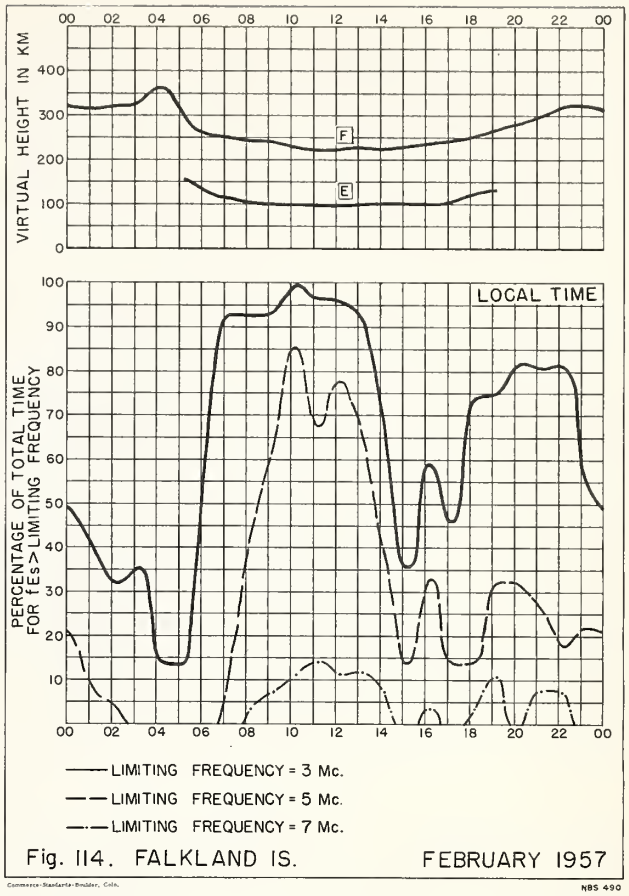

Fig. 114. FALKLAND IS. FEBRUARY 1957

Commerce-Standards-Boulder, Colo.

NBS 490

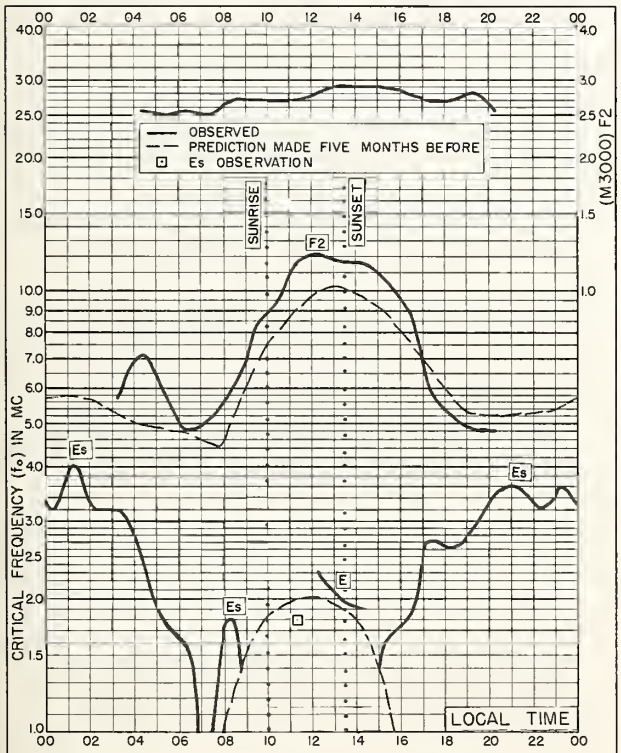

Fig. 115. TROMSO, NORWAY
69.7°N, 19.0°E NOVEMBER 1956

NBS 503

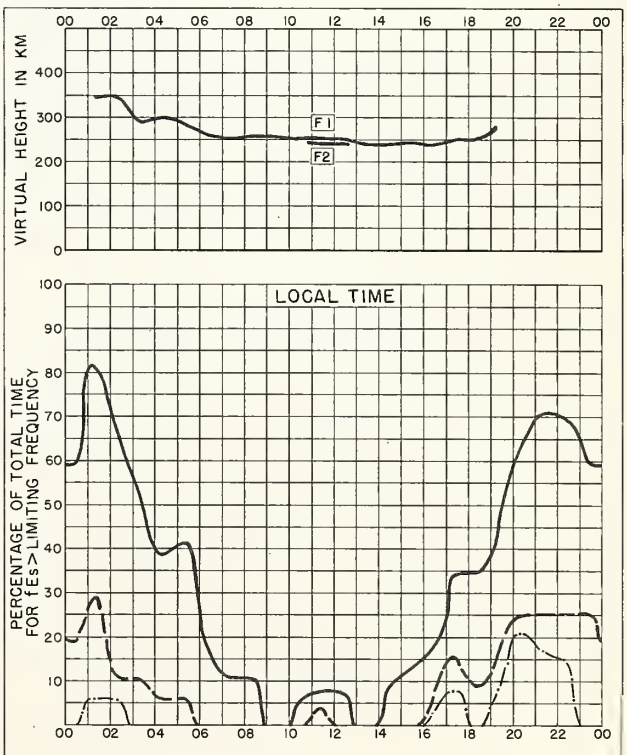

Fig. 116. TROMSO, NORWAY NOVEMBER 1956

Commerce-Standards-Boulder, Colo.

NBS 490

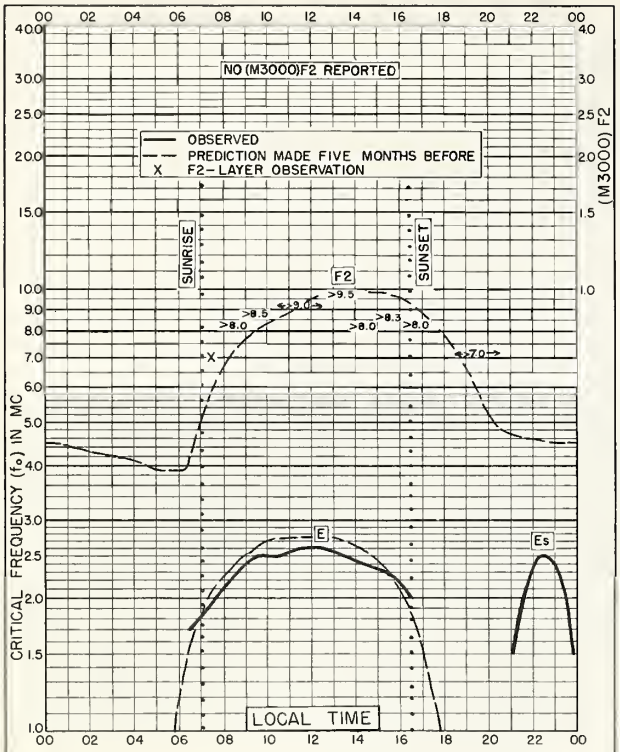

Fig. 117. LULEA, SWEDEN
65.6°N, 22.1°E OCTOBER 1956

NBS 503

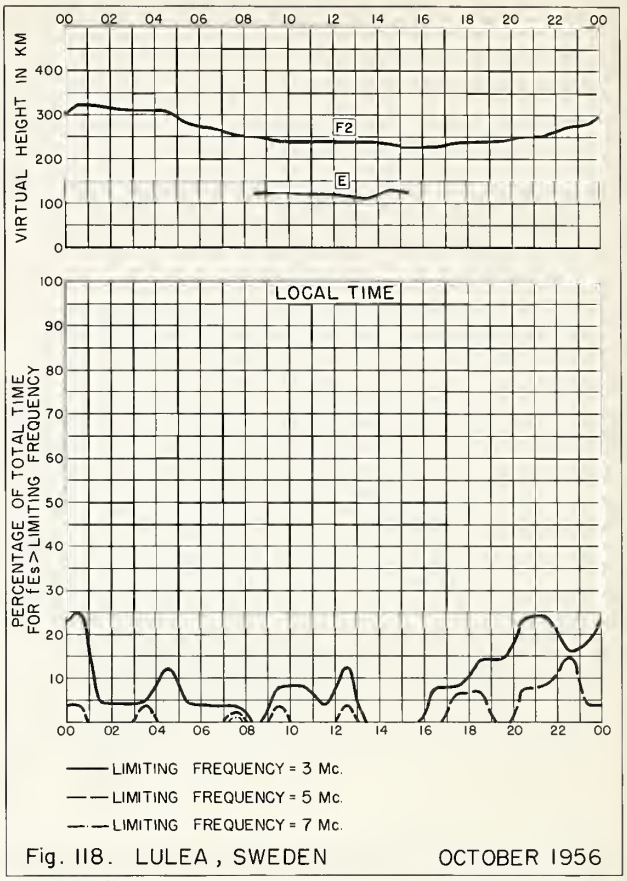

Fig. 118. LULEA, SWEDEN OCTOBER 1956

Commerce-Standards-Boulder, Colo.

NBS 490

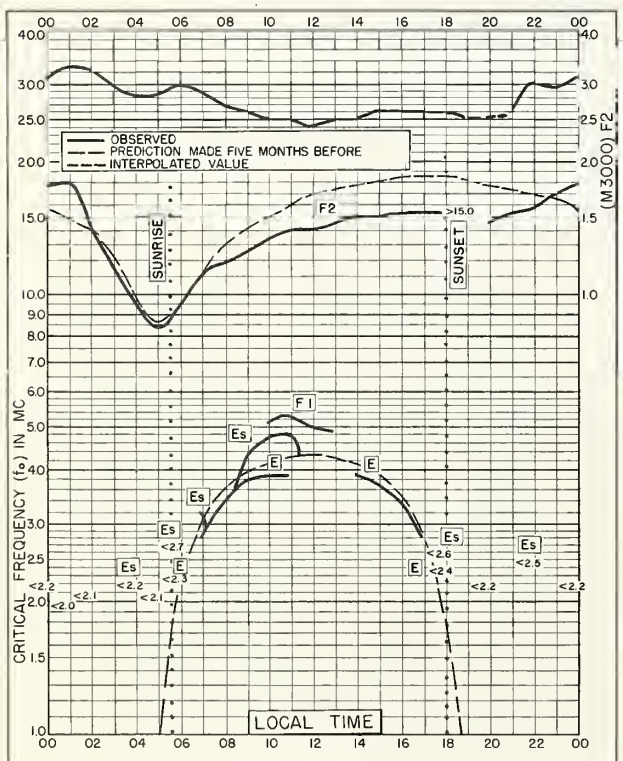

Fig. 119. SAO PAULO, BRAZIL
23.5°S, 46.5°W OCTOBER 1956

NBS 503

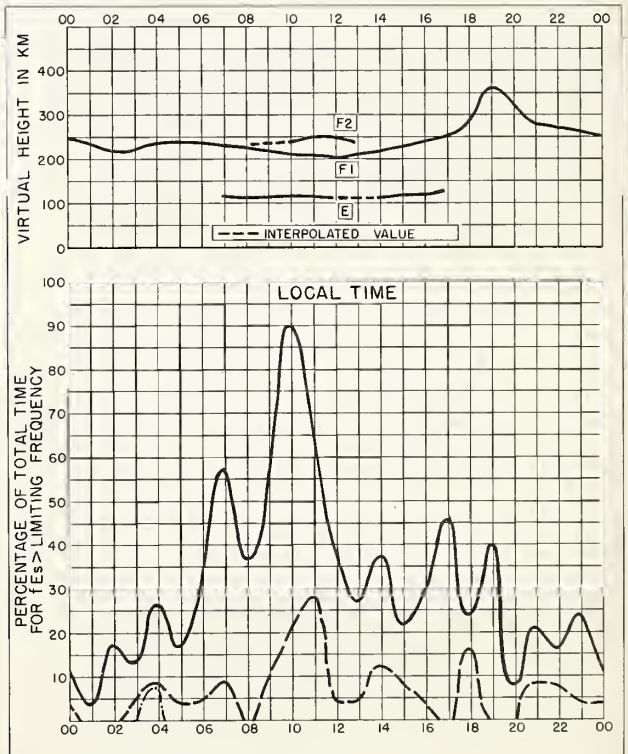

Fig. 120. SAO PAULO, BRAZIL OCTOBER 1956

Commerce-Standards-Boulder, Colo.

NBS 490

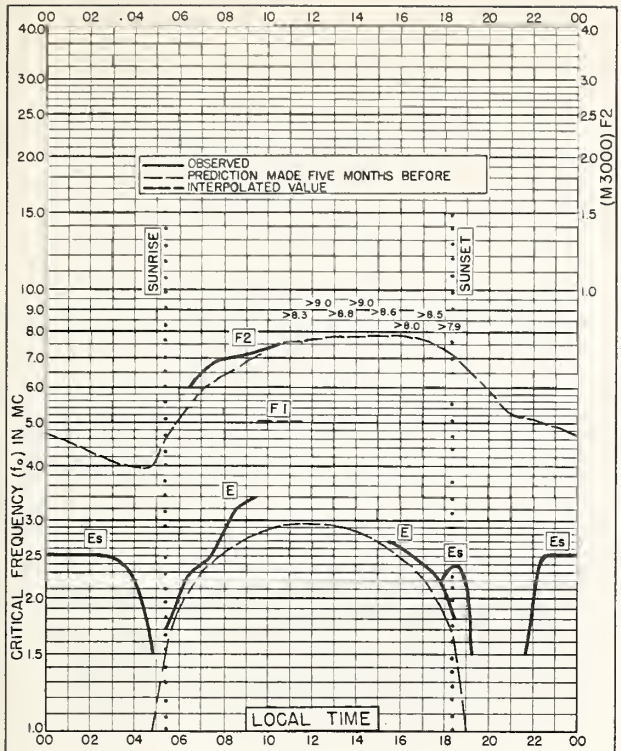

Fig. 121. LULEA, SWEDEN
65.6°N, 22.1°E SEPTEMBER 1956

NBS 503

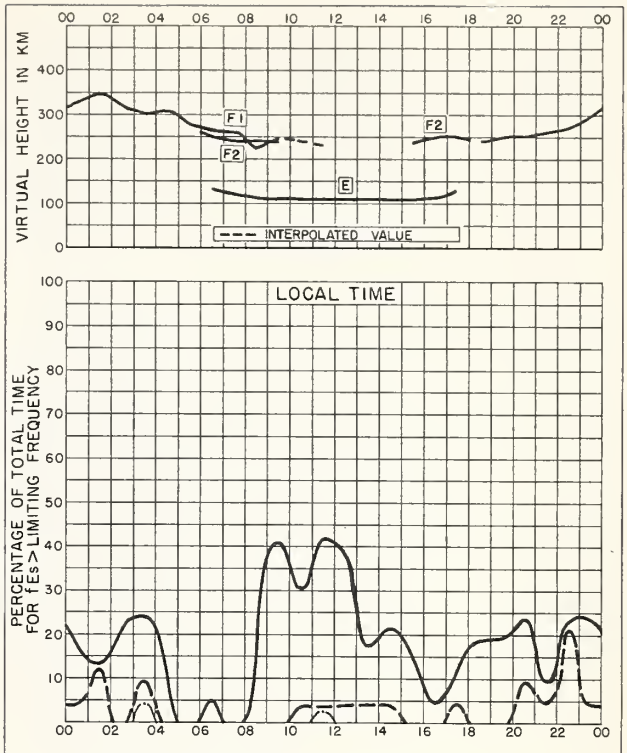

Fig. 122. LULEA, SWEDEN SEPTEMBER 1956

NBS 490

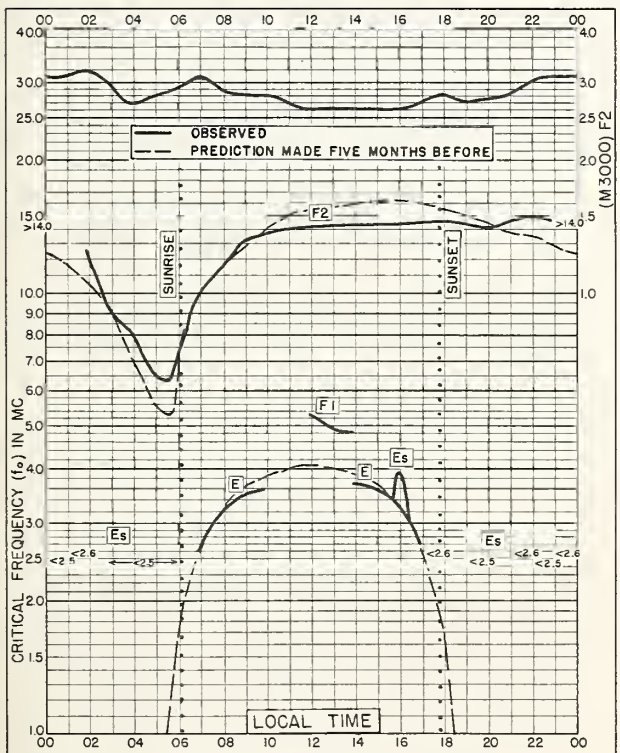

Fig. 123. SAO PAULO, BRAZIL
23.5°S, 46.5°W SEPTEMBER 1956

NBS 503

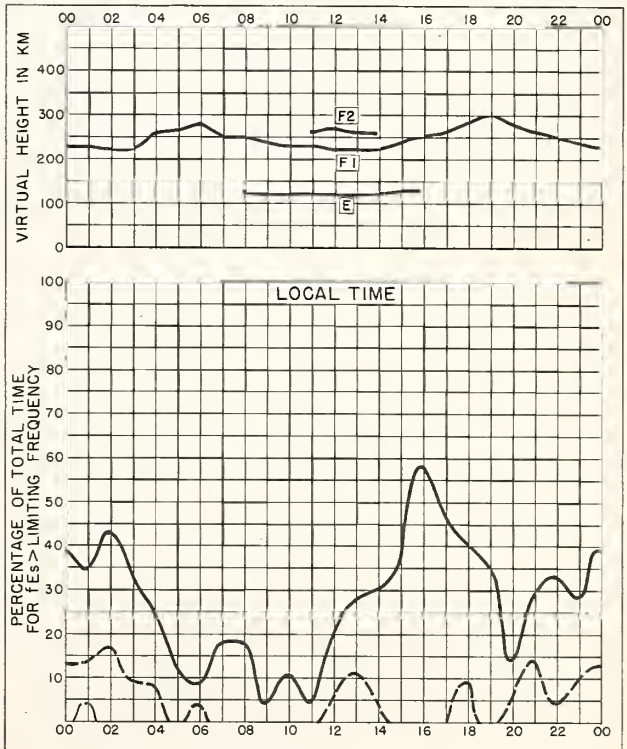

Fig. 124. SAO PAULO, BRAZIL SEPTEMBER 1956

NBS 490

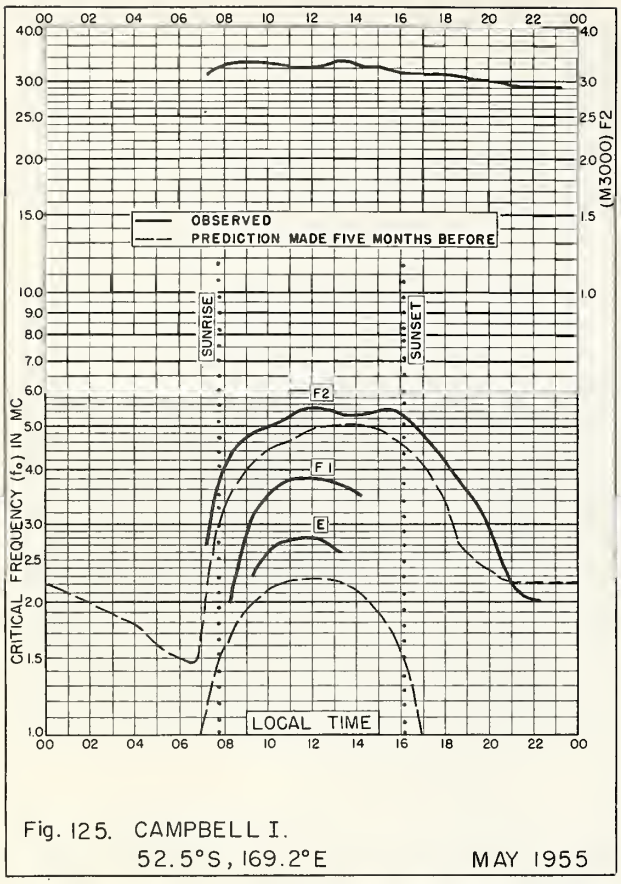

Fig. 125. CAMPBELL I.
52.5°S, 169.2°E MAY 1955

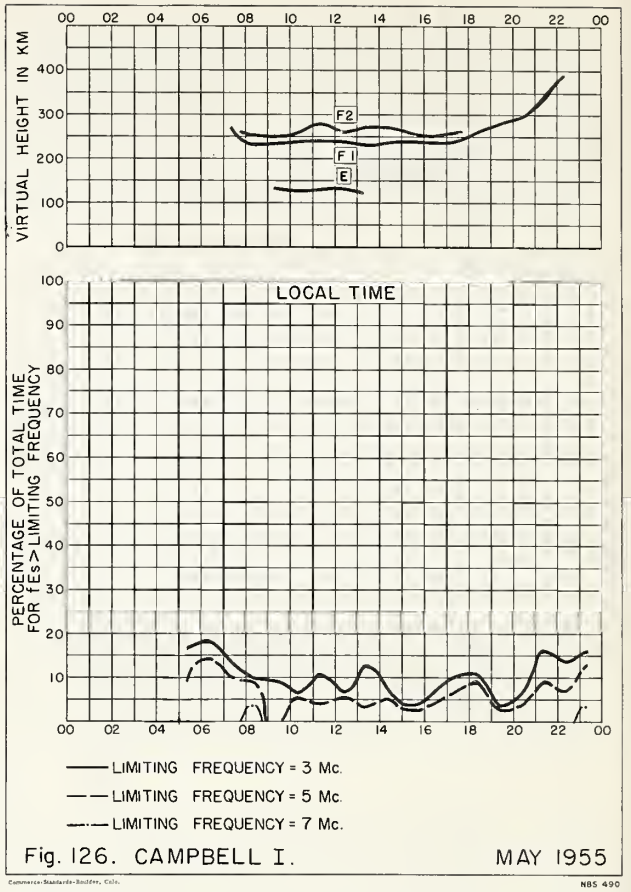

Fig. 126. CAMPBELL I. MAY 1955

Commerce-Standards-Boulder, Colo. NBS 490

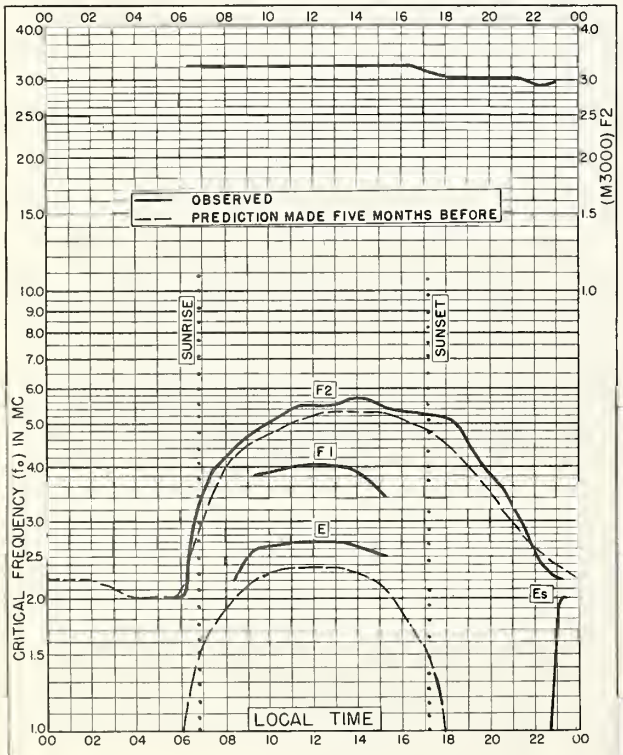

Fig. 127. CAMPBELL I.
52.5°S, 169.2°E APRIL 1955

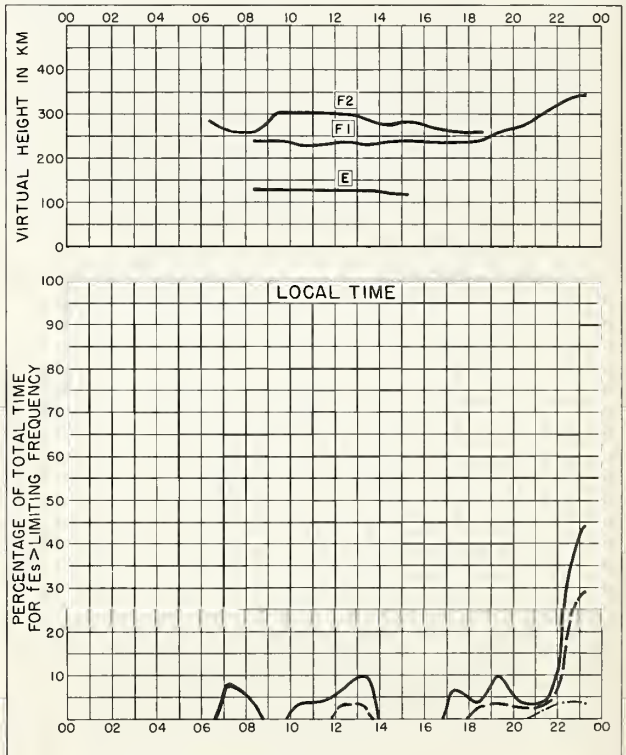

Fig. 128. CAMPBELL I. APRIL 1955

Commerce-Standards-Boulder, Colo. NBS 490

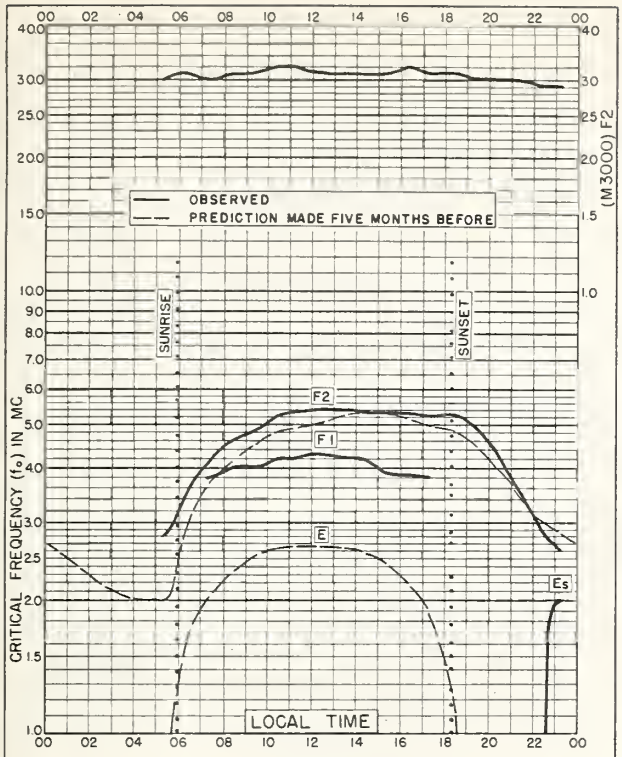

Fig. 129. CAMPBELL I.
52.5°S, 169.2°E MARCH 1955

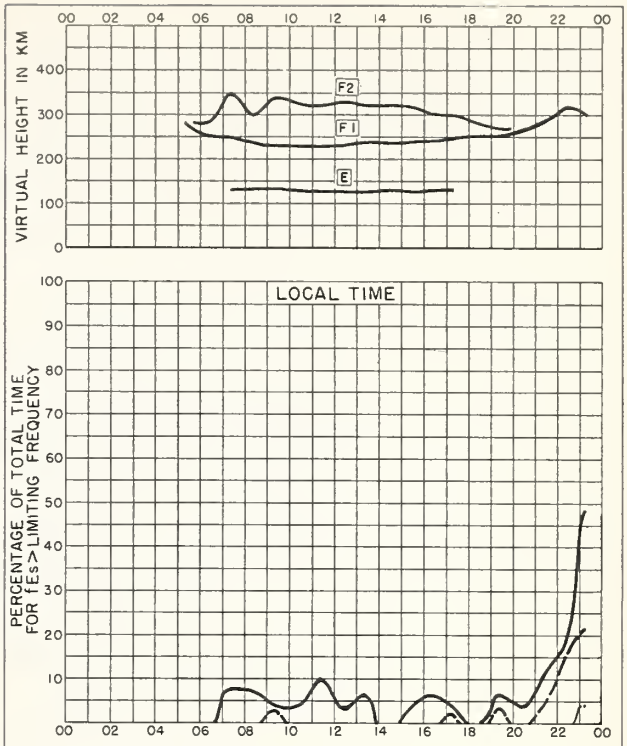

Fig. 130. CAMPBELL I. MARCH 1955

Commerce-Standards-Boulder, Colo. NBS 490

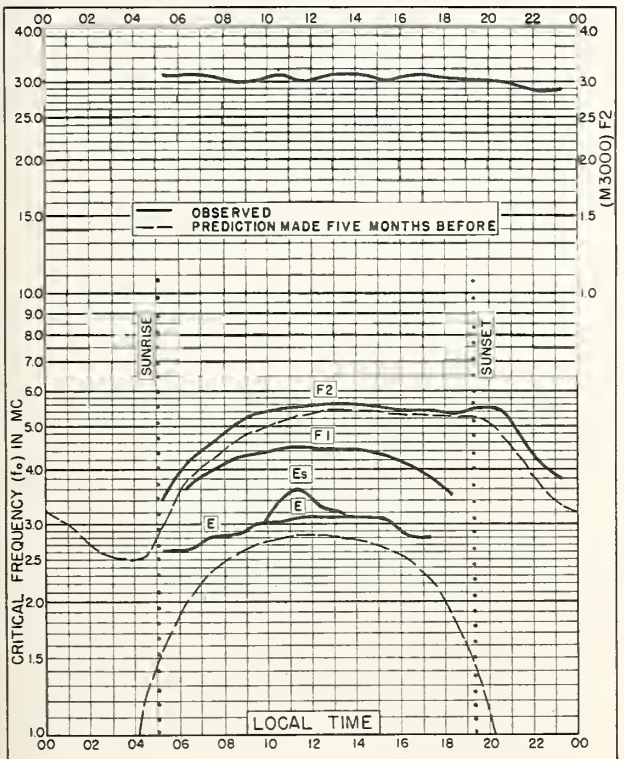

Fig. 131. CAMPBELL I.
52.5°S, 169.2°E FEBRUARY 1955

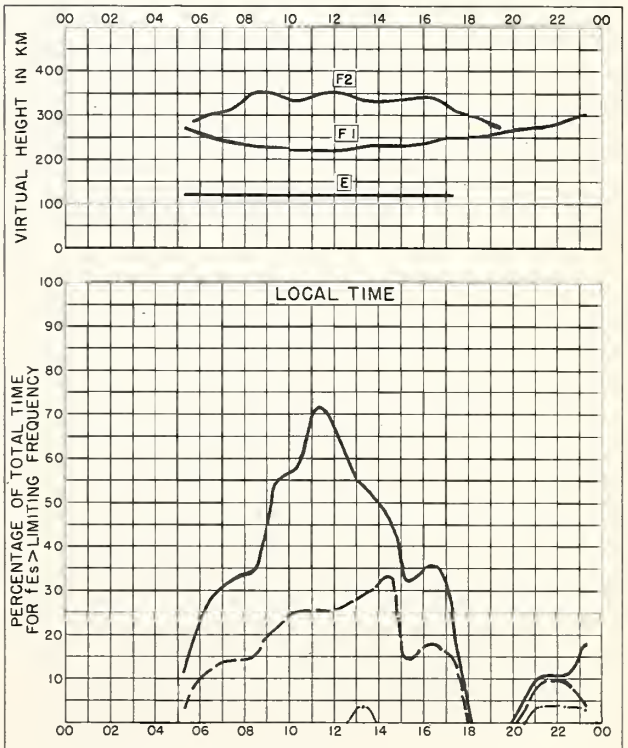

Fig. 132. CAMPBELL I. FEBRUARY 1955

Commerce-Standards-Boulder, Colo. NBS 490

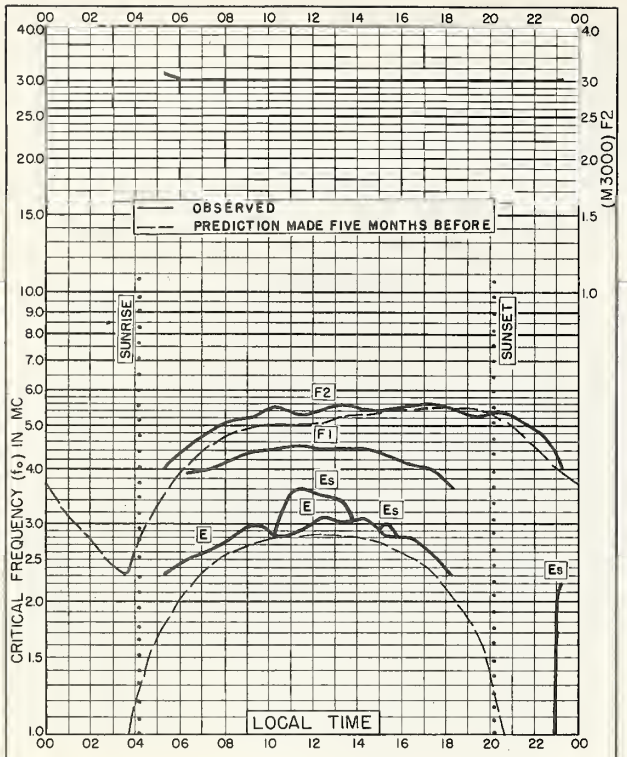

Fig. 133. CAMPBELL I.
52.5°S, 169.2°E JANUARY 1955

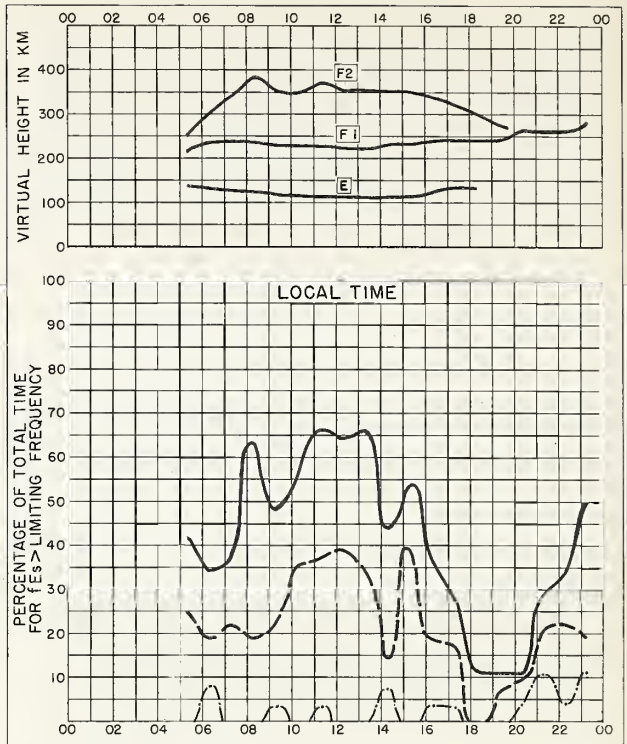

Fig. 134. CAMPBELL I. JANUARY 1955

Commerce-Standards-Boulder, Colo. NBS 490

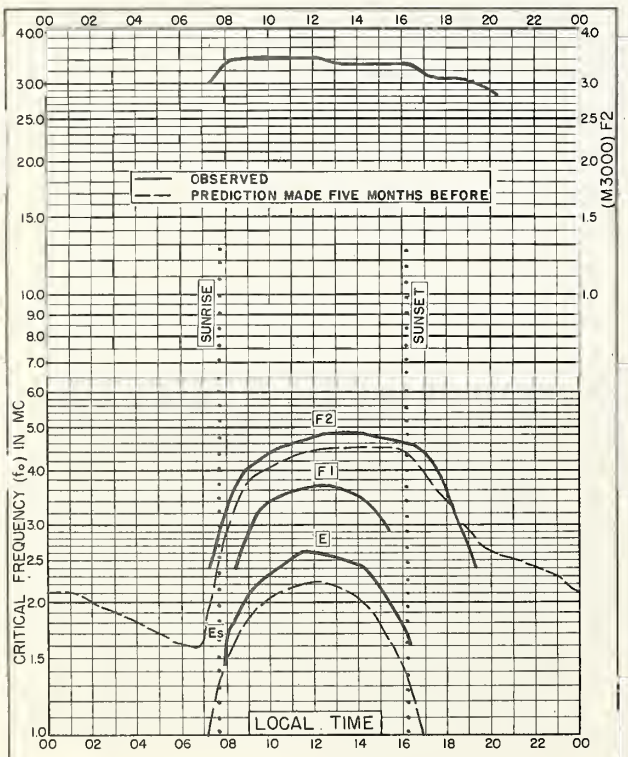

Fig. 135. CAMPBELL I.
52.5°S, 169.2°E MAY 1954

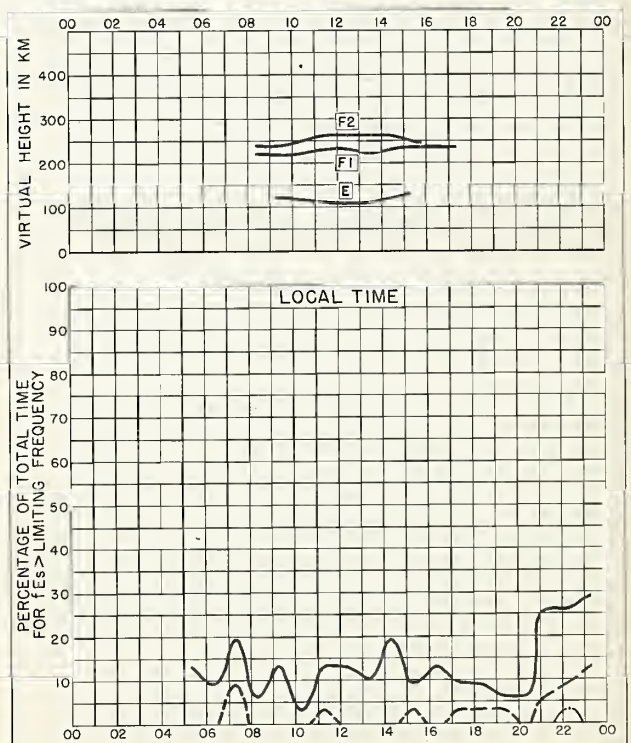

Fig. 136. CAMPBELL I. MAY 1954

Commerce-Standards-Boulder, Colo. NBS 490

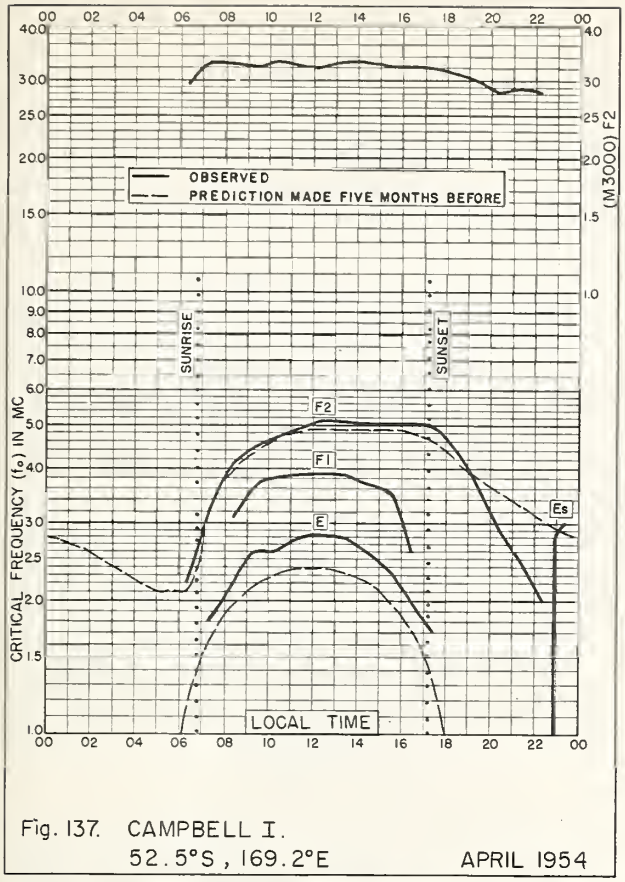

Fig. 137. CAMPBELL I.
52.5°S, 169.2°E APRIL 1954

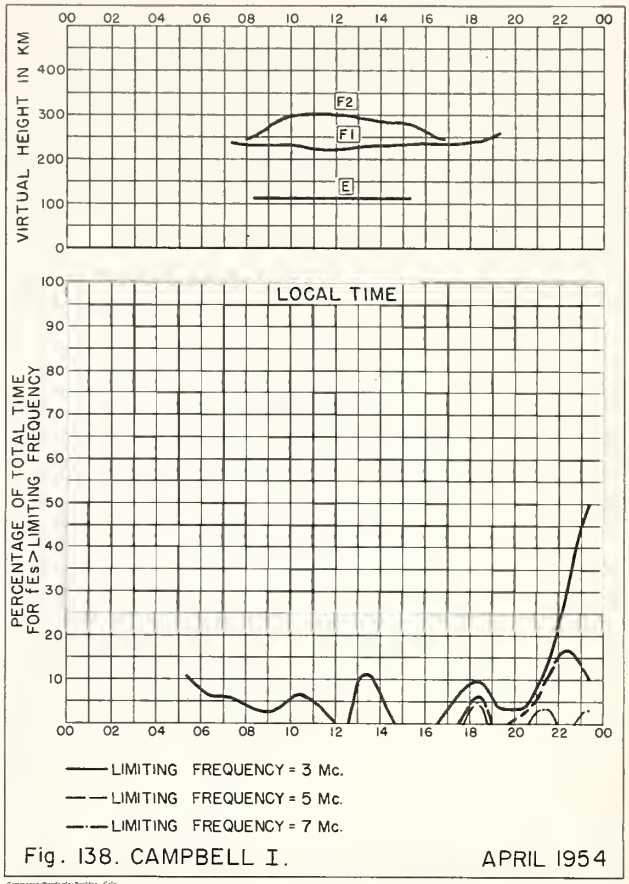

Fig. 138. CAMPBELL I. APRIL 1954

Commerce-Standards-Boulder, Colo. NBS 490

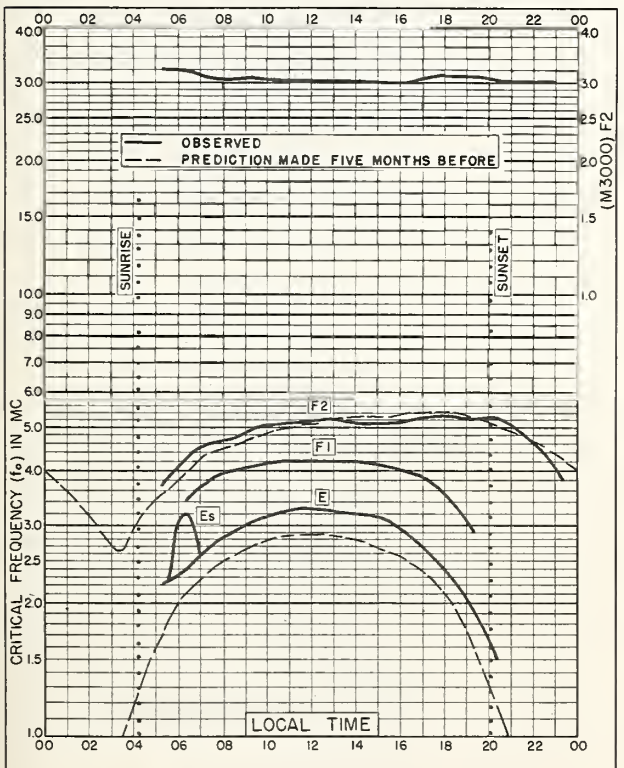

Fig. 139. CAMPBELL I.
52.5°S, 169.2°E JANUARY 1954

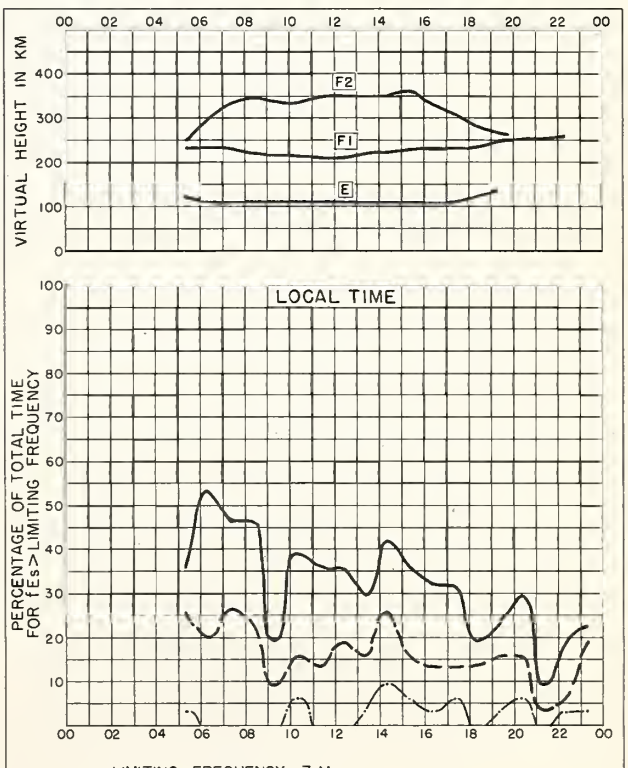

Fig. 140. CAMPBELL I. JANUARY 1954

Commerce-Standards-Boulder, Colo. NBS 490

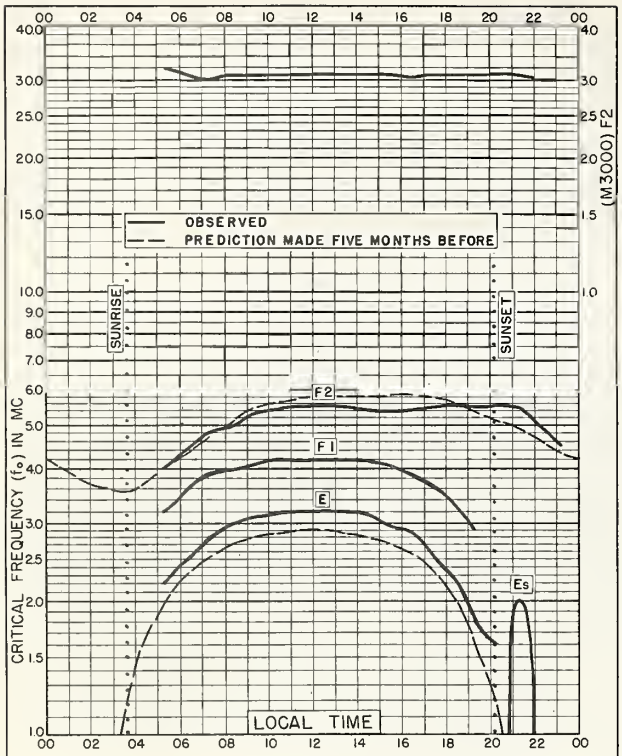

Fig. 141. CAMPBELL I.
52.5°S, 169.2°E DECEMBER 1953

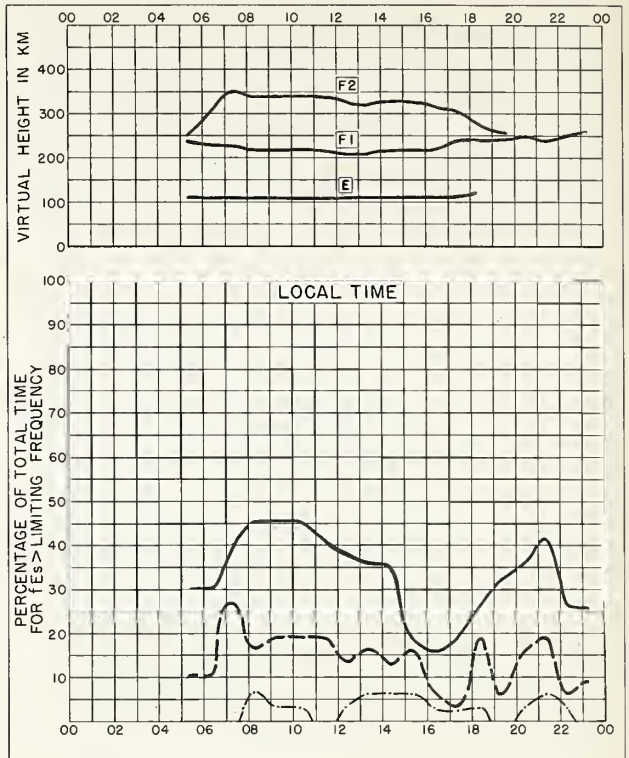

Fig. 142. CAMPBELL I. DECEMBER 1953

Commerce-Standards-Boulder, Colo. NBS 490

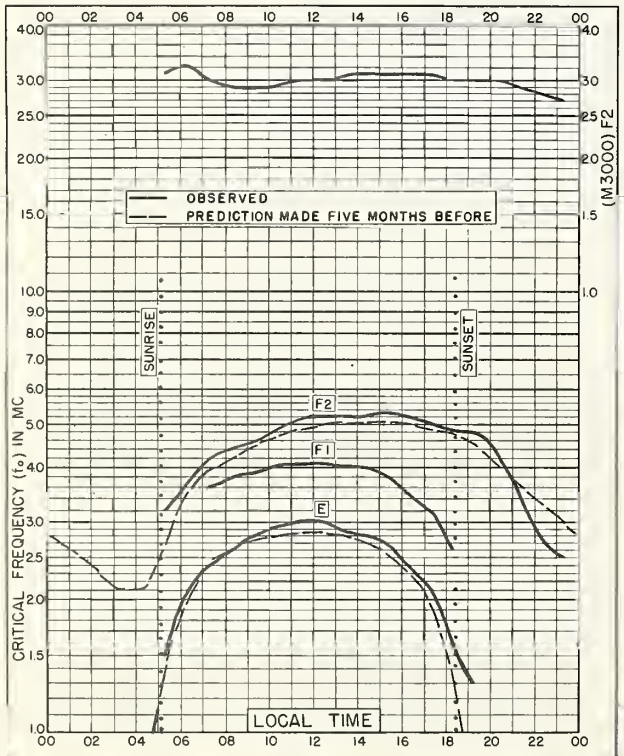

Fig. 143. CAMPBELL I.
52.5°S, 169.2°E OCTOBER 1953

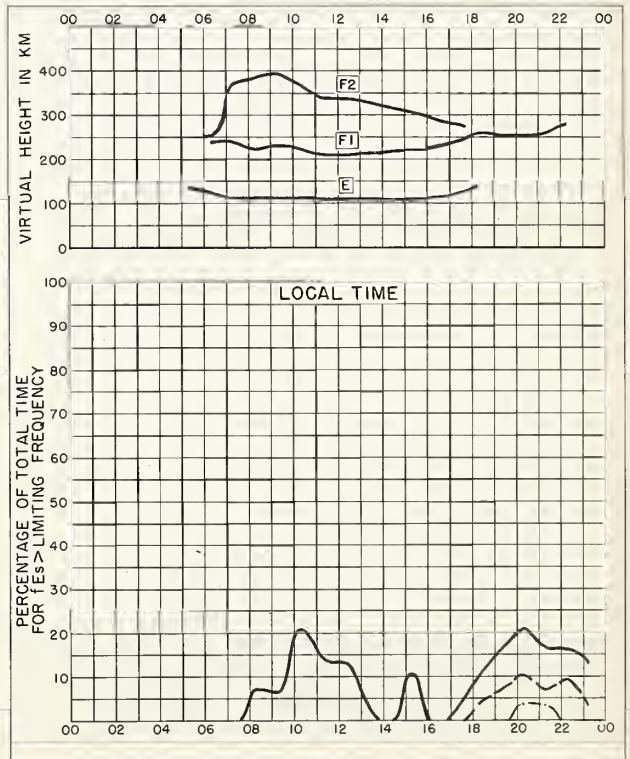

Fig. 144. CAMPBELL I. OCTOBER 1953

Campbell-Standard-Boulder, Colo. NBS 490

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in CRPL-F160 (Part A)

Index (CRPL-F160 (Part A), continued)

Index (CRPL-F160 (Part A), concluded)

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